UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE – REGION SIX

MT. BAKER - SNOQUALMIE NATIONAL FOREST

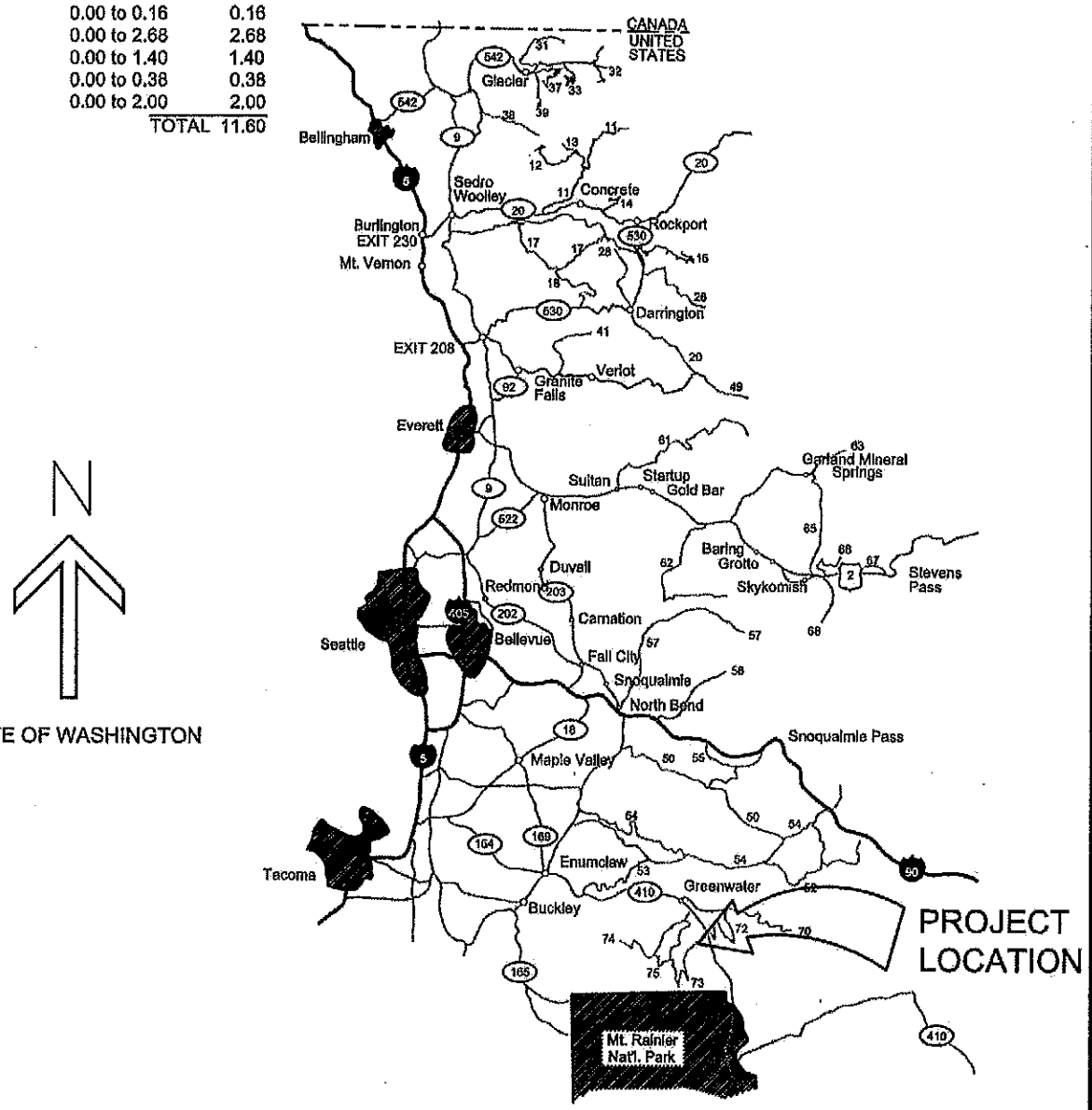
SNOQUALMIE RANGER DISTRICT

SPECIFIED ROAD WORK DRAWINGS FOR PROPOSED

WHITEWATER THIN TIMBER SALE

ROAD NO.	MP to MP	MILES
7300	0.00 to 2.32	2.32
7300145	0.00 to 0.35	0.35
7305	0.00 to 1.93	1.93
7305110	0.18 to 0.56	0.38
7305210	0.00 to 0.16	0.16
7315	0.00 to 2.68	2.68
7315310	0.00 to 1.40	1.40
7315410	0.00 to 0.38	0.38
7320	0.00 to 2.00	2.00
	TOTAL	11.60

INDEX TO SHEETS



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STATE OF WASHINGTON

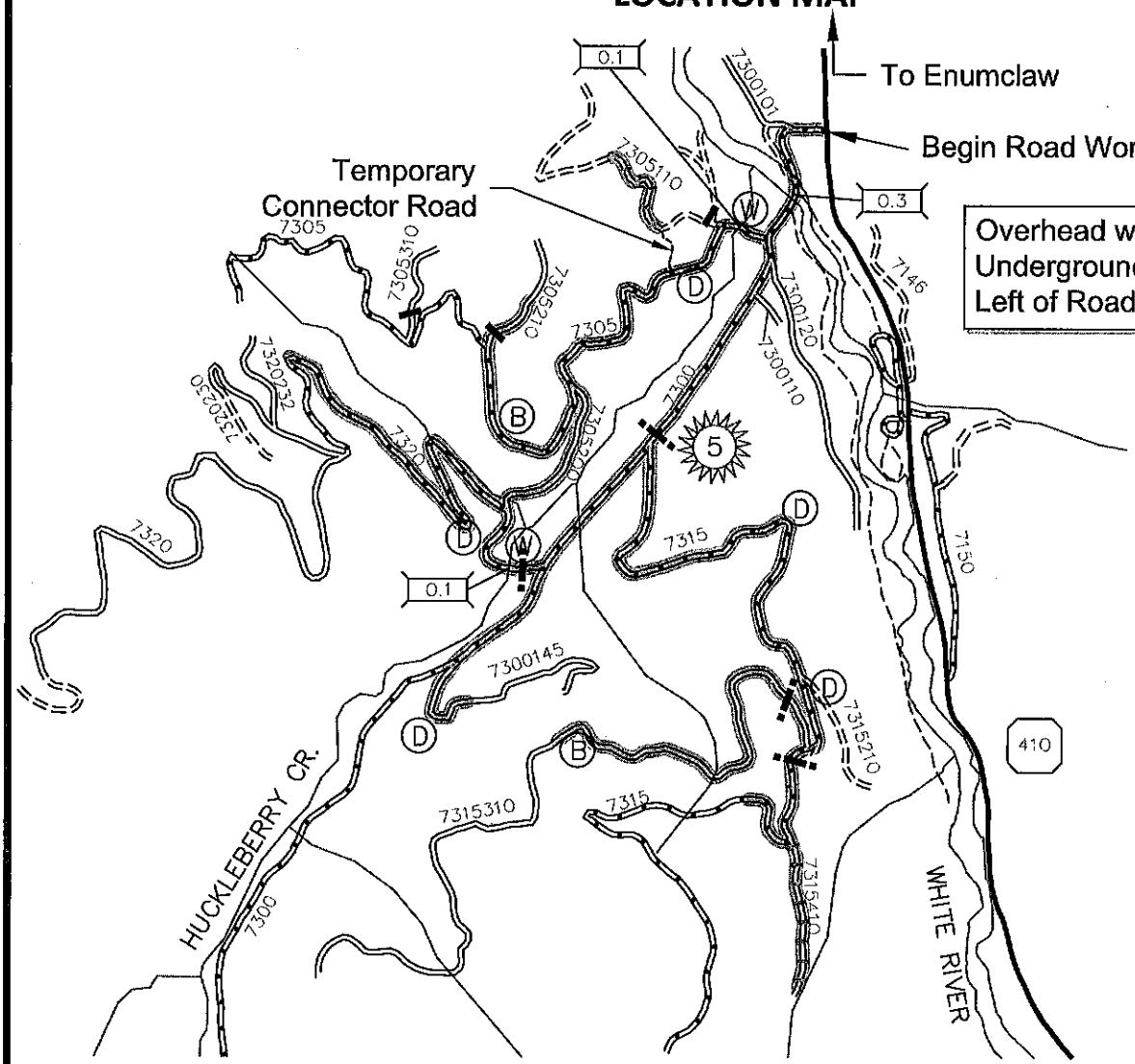
VICINITY MAP

PREPARED BY:	RECOMMENDED BY:
NAME DESIGN ENGINEER 8-22-13 DATE	NAME ASSISTANT FOREST ENG. 8/23/13 DATE
REVIEWED BY:	APPROVED BY:
NAME PROJECT TEAM LEADER 8-22-13 DATE	NAME DISTRICT RANGER 8/23/13 DATE

SHEET	OF
2	31

WHITEWATER THIN TIMBER SALE

LOCATION MAP



NOTES:

1. Highlighted roads shown are the specified roads identified for this project.

2. Three bridges within the project area. Vehicles and equipment that exceed State highway legal loads and widths shall obtain valid Forest Service overload/over width permits (Allow 21 days for permit processing). The three bridges are located as follows:
   - Forest Service Road 7300, MP 0.3
   - Forest Service Road 7305, MP 0.1
   - Forest Service Road 7320, MP 0.1

3. For Road Closures, Restrictions, Signage, and Other Requirements see General Notes for specific road information.

4. For symbol # 5, this is a seasonal gate closure on Forest Road 73 for winter recreation. There shall be no road work beyond this gate anytime from December 15 to March 15 annually.

0 1/2 1 2

MILES

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TRANSPORTATION SYSTEM LEGEND

- TWO LANE PAVED HWY
- TWO LANE PAVED HWY
- IMPROVED RD/PAVED
- IMPROVED RD/GRAVEL (PASSENGER CARS)
- UNIMPROVED RD/GRAVEL (HIGH CLEARANCE VEHICLES)
- UNIMPROVED RD
- TRAIL
- 410 WASH STATE HWY
- # SEASONAL RESTRICTIONS
- 1.5 BRIDGE w/M.P.
- LOCKED GATE
- BLOCKED ROAD
- D DESIGNATED DISPOSAL AREAS
- W DESIGNATED WATER WITHDRAWAL LOCATIONS
- B DESIGNATED BORROW SOURCES

WHITEWATER THIN TIMBER SALE

SUMMARY OF QUANTITIES

(FOR EACH SPECIFIED ROAD)

PAY ITEM	DESCRIPTION OF WORK	UNIT	ROAD NUMBER									TOTAL
			7300	7300145	7305	7305110	7305210	7315	7315310	7315410	7320	
15101	MOBILIZATION (INCLUDES CLEANING OF EQUIPMENT, SIGNING, TRAFFIC CONTROL, SANITATION)	LS	COMMON TO ALL ROADS									1
20105	CLEARING AND GRUBBING, DISPOSAL OF TOPS AND LIMBS F, LOGS F, STUMPS F	SY	0	140	0	0	0	0	100	100	0	340
20301A	REMOVAL OF EXISTING CULVERT	EACH	1	1	0	1	0	1	0	0	0	4
20301B	REMOVAL OF LARGE ROCKS	EACH	0	0	0	0	2	0	0	0	0	2
20401	ROADWAY EXCAVATION, COMPACTION METHOD B, FINISHING METHOD C	CY	0	60	507	50	150	0	200	100	0	1067
20419	DRAINAGE EXCAVATION, DITCH RECONSTRUCTION	MILE	0.617	0.04	0.65	0	0	0.18	0.4	0	0.24	2.127
20420	DRAINAGE EXCAVATION, TYPE DRIVABLE DIP	CY	0	0	0	0	30	0	0	15	0	45
20950	CULVERT BEDDING MATERIAL (COMMERCIAL SOURCE)	TON	12	9	3	12	0	9	0	5	0	50
23050A	ROADSIDE BRUSHING (NORMAL)	MILE	2.32	0	0	0	0.16	2.68	0	0	2	7.16
23050B	ROADSIDE BRUSHING (HEAVY)	MILE	0	0	1.93	0	0	0	0	0.38	0	2.31
23050C	ROADSIDE BRUSHING (EXTRA HEAVY)	MILE	0	0.35	0	0.38	0	0	1.4	0	0	2.13
25101A	PLACED RIPRAP, CLASS 5 (COMMERCIAL SOURCE) FOR CULVERT INLETS & OUTLETS ON ALL ROADS	TON	95	38	5	17	10	11	3	10	0	189
25101B	PLACED RIPRAP, 2-4" CLEAN (COMMERCIAL SOURCE)	TON	0	0	0	0	33	0	0	8	0	41
30322A	ROAD RECONDITIONING, COMPACTION METHOD A (NORMAL)	MILE	2.22	0	1.93	0	0.16	2.68	0	0.38	2	9.37
30322B	ROAD RECONDITIONING, COMPACTION METHOD A (HEAVY)	MILE	0	0.35	0	0.38	0	0	1.4	0	0	2.13
32201	AGGREGATE BASE, GRADING EQUAL TO WSDOT MIX 1-1/4" MINUS, COMPACTION METHOD A (COMMERCIAL SOURCE)	TON	15	57	80	18	45	10	60	26	173	484
60275A	18-INCH HIGH DENSITY POLYETHYLNE PIPE WITH SMOOTH INTERIOR AND ANNULAR EXTERIOR, COMPACTION METHOD B	FT	0	0	30	120	0	0	0	0	0	150
60275B	24-INCH HIGH DENSITY POLYETHYLNE PIPE WITH SMOOTH INTERIOR AND ANNULAR EXTERIOR, COMPACTION METHOD B	FT	70	30	0	0	0	0	0	35	0	135
60275C	36-INCH HIGH DENSITY POLYETHYLNE PIPE WITH SMOOTH INTERIOR AND ANNULAR EXTERIOR, COMPACTION METHOD B	FT	55	30	0	0	0	55	0	0	0	140
60501	UNDERDRAIN, 4" PERFORATED DRAIN PIPE, SCHEDULE 80, 2-1/2" CLEAN DRAIN ROCK, GEOTEXTILE TYPE 1	FT	0	0	0	0	0	0	0	0	24	24
60790	RECONDITION DRAINAGE STRUCTURE	EACH	1	0	0	0	0	0	1	2	1	5
62503	SEEDING, DRY METHOD WITH MULCH (SEED MIX C1)	SY	440	238	701	306	255	96	347	246	104	2733
63358	INSTALLATION OBJECT MARKERS FOR BRIDGE	EACH	2	0	0	0	0	0	0	0	2	4

GENERAL NOTES

1. **Item 15101,** Mobilization – In addition to what is identified in Section 151 of the Specifications, mobilization includes construction signing, traffic control, and cleaning of equipment as indirect costs to this item. Equipment shall be washed (to remove all material that could potentially contain weed seeds) and inspected by the Forest Service Engineering Representative (ER) prior to entering National Forest lands.

2. **Item 20105**, Clearing and grubbing – Slash shall be hauled and scattered outside unit boundaries 10' beyond road edge.

3. **Item 20301 A,B**, Removal of culvert – Includes the removal and disposal of all culverts designated in this project for removal. All culverts shall become the property of the Purchaser and be removed off National Forest Lands. Follow all Federal, State, and Local laws for disposal of culverts. Removal of rocks – Rocks shall be removed for access and shall be replaced after project completion.

4. **Item 20401**, Roadway Excavation – Item includes roadway excavation, embankment, compaction, hauling of waste material, and maintaining waste site. All excess material shall be hauled to one of the designated waste areas identified on the Location Map and staked in the field by the ER.

5. **Item 20419**, Drainage excavation, type ditch reconstruction. See the Work Description List for location and the Ditch Reconstruction Typical for details. All excess material shall be hauled to one of the designated waste areas identified on the Location Map and staked in the field by the ER.

6. **Item 20420**, Drainage excavation, type drivable dip. See the Work Description List for location and the Drivable Dip Typical for details. All excess material shall be hauled to one of the designated waste areas identified on the Location Map and staked in the field by the ER.

7. **Item 20950**, Pipe bedding – Bedding material for culvert installations shall meet the requirements of Item 32201 (Aggregate Base) and shall be obtained from a certified weed free Commercial Source. Submit material certification, test reports, and gradation reports to the ER for approval. Load and weight tickets shall be submitted daily to the ER. No bedding material shall be placed until the pipe bed has been constructed with positive camber.

8. **Item 23050 A,B,C**, Roadside brushing – This work consists of cutting and disposal of the existing roadway vegetation on all roads. Clearing limits and requirements are shown on the Road Brushing Typical. All slash from brushing shall be scattered 10' beyond the edge of road on the fill slope. Do not deposit slash from brushing inside timber sale unit boundaries. Loose debris such as logs, rocks and other large debris shall be removed prior to brushing operations. Normal roadway brushing – brushing can generally be accomplished with a mechanical mowing machine. Most all of the vegetation is less than 3" in diameter. Minor amounts of windfall may be present and require chainsaw and an excavator to remove. Heavy roadway brushing – brushing shall need to be accomplished with other larger mechanized equipment and/or a chainsaw. Vegetation is generally up to 6" in diameter and removal of windfall is required. Brushing slash shall be hauled and piled in a designated disposal site. Extra heavy roadway brushing – brushing to be accomplished with other larger mechanized equipment and/or a chainsaw. Most all of the vegetation is 6" and greater in diameter and removal of windfall is required. Brushing slash shall be hauled and scattered outside unit boundaries 10' beyond roads edge.

9. **Items 25101 A,B,** Placed riprap, class 5 – Riprap shall be obtained from a certified weed free Commercial Source and shall be approved, in writing, by the ER. Load and weight tickets shall be submitted daily to the ER.

GENERAL NOTES

10. **Item 30322 A,B**, Road Reconditioning –This work consists of grading, shaping, and compacting the roadway, grading, cleaning and reshaping all ditches, cleaning all culvert inlets and outlets. See the Road Reconditioning Typical for details. Compaction with the use of hauling and spreading equipment is required.

11. **Item 32201**, Aggregate Base – The aggregate shall be obtained from a certified weed free Commercial Source. It shall meet the requirements equivalent to the Washington State DOT mix 1-1/4" minus, dense graded. Material certification, test reports, and gradation report shall be submitted to the ER for approval prior to delivery to the project. Quantities are measured by the Ton. Load and weight tickets shall be submitted daily to the ER for verification of quantities. Compaction Method A (hauling equipment) requires achieving optimum moisture content suitable for achieving compaction, layer placing, and compacting with hauling and spreading equipment until visual displacement ceases. All work associated with obtaining, hauling, placing, processing, and compaction are indirect costs to Item 32201.

12. **Items 60275 A,B,C**, 18", 24" & 36" corrugated polyethylene pipe with Bell and Spigot connections – This work consists of furnishing and installing the culvert pipes. See the Drainage Construction Typicals for installation details. Compaction Method B is required as described in Section 209 of the Specifications. All culvert installations at locations with live streams or presence of water shall comply with the MOU and be dewatered by pumping, temporary bypass culvert, or ditching. Dewatering is an indirect cost to the culvert installation. Construct pipe bed with positive camber prior to placing bedding material.

13. **Item 60790**, Recondition drainage structure - This work consists of re-establishing the original culvert catch basin dimensions and cleaning debris out of the culvert inlets and outlets. See the Drainage Construction Typical for catch basin details.

14. **Item 62501**, Seeding (C-1), dry method (with straw mulch) – This work consists of seeding and mulching all constructed fill slopes, cut slopes, and all disturbed soil areas beyond the traveled way and all disturbed soil areas for culvert installations. See the Supplemental Project Specifications for seed and mulch (weed free straw) requirements, application, and timing.

15. **Item 63358**, Installation of object markers for bridge – Object markers, reflective, shall be 12"x36", Type-3 Object Markers (OM3), yellow and black. Install object markers on 4"x4"x10' treated posts with vandal proof bolts and nuts. Installation shall meet the current edition of the MUTCD.

16. **Designated Borrow Source** – Borrow sources shall be used for unclassified borrow as described in the Work List. There are 2 designated borrow sources for this project. 1. **Road 7305 between MP 1.65 to 1.85** where the road is planned for widening on the right side cut bank. Borrow is by widening of the road and scaling the cut bank between these mile posts. Utilize this material as road base rock material for Temporary Road 1a and other Temporary road base work. 2. **Road 7315310 at MP 1.12** is from widening the existing road on the left to create a truck turnaround. Any other excess and suitable material generated as the result of other construction activities may be used for unclassified borrow if approved in advance by the ER.

17. **Designated Disposal Areas** – Disposal areas are for slash, debris, soil, and other waste material generated as a result of construction activities that are not designated for other specific locations. Place material within locations and as flagged by the ER. All waste shall be shaped to drain, seeded and mulched, and are indirect costs to those pay items.

18. **Timing of Drainage Work in live streams** – All work in live streams shall be done under the provisions of the **2012 WDFW-USFS MOU** (Washington State Department of Fish & Wildlife – US Forest Service Memorandum of Understanding). The in-water work window is **July 16th** to **August 15th** for this project. A copy of the applicable **MOU** documents found in the Contract Documents shall be readily available on the jobsite at all times.

GENERAL NOTES

19. **Water Withdrawal Sources** – Only the designated water drafting locations shown on the Location Map shall be used. This water shall be used for road construction (embankment compaction) and maintenance (grading and dust abatement) as necessary. Water Withdrawal shall only occur at the following locations and in compliance with all criteria below. Submit a water withdrawal plan to the ER for review and approval 7 days prior to starting work.

    - Road 7305 MP 0.1 at Huckleberry Creek (T18N, R10E, S6)
    - Road 7320 MP 0.1 at Huckleberry Creek (T18N, R9E, S12)

    Screening requirements:
    The withdrawal hose or pipe must be fitted with a screen with a minimum effective surface area of at least one square inch of functional screen area for every gallon per minute (gpm) of water drawn through it, a round or square screen mesh that is no larger than 2.38 mm (3/32 or 0.094 inches) in the narrow dimension, or any other shape that is no larger than 1.75 mm (1/16 or 0.069 inches) in the narrow dimension.

20. **Road Closures and Notification Requirements – All work costs as shown below are incidental to 15101 Mobilization.**

    1. Notify the Contracting Officer or Engineering Representative 7 Calendar days prior to construction and harvest activities regarding this project.
    2. Install 1 Road Information Sign on FSR 7300 at MP 0.10 meeting all the requirements of the MUTCD 2012 with the following information. Sign shall be present and maintained during all ongoing project road work.

    ROAD CONSTRUCTION
    DELAYS
    DATE X TO X
    TIME X TO X
    ROAD # 73 X X X X X

    Sign shall be 60"x60", reflective, white with black letters
    Installation on 2, 4"x4" pressure treated post with vandal proof nuts and bolts

    3. For construction activity work where the road will be closed, install at the beginning of each road, a closure sign meeting all the requirements of the MUTCD 2012 with the following information. Sign shall be present and maintained during all project construction work.

    ROAD CLOSED
    FOR CONSTRUCTION
    DATE X TO X

    Sign shall be 48" x 48", reflective, white with black letters
    Sign may be installed on 4"x4" post or placed on a mobile stand

    4. Road Work Ahead signs, At a minimum, 2 Standard sized signs, Orange with Black Letters, shall be installed on each side of each work activity while work is ongoing. Placement of signs shall be reasonably located near the project work sites.

    5. Road Closures – On roads that are open to the public, there shall be NO road closures or road construction hauling activities from Noon on Fridays through to Monday 0600 and on any Federally recognized holidays.

    6. Specific Road Requirements – FSR 7315, Suntop – Annually during contract work
    NO road construction work is allowed within Unit 8 and Unit 801 of this road between May 15 and July 1 unless otherwise approved by the Contracting Officer.

WHITEWATER THIN TIMBER SALE **WORK DESCRIPTION LIST**			SHEET 7	OF 31
Rd. #7300 - MP 0.00 to 2.32				
Mile Post	***Item***	***Description***	***Units***	***Estimated Quantity***
0.00	**Begin Specified Road Work for Road 7300,** (Jct. with State Hwy 410)			
0.00 to 2.32	23050A	Begin Roadside Brushing	Mile	2.32
0.10 to 2.32	30322A	Begin Road Reconditioning	Mile	2.22
0.10	**Road 7300101 Right**, End of Pavement			
0.20 0.30	20419	Reconstruct Ditch Left for 525'	Mile	0.10
	62503	Seed and mulch material hauled to waste area	SY	44
0.30 to 0.60	**Overhead Wires**			
0.30	63358	Install object markers at bridge	EA	2
0.50 to 0.54	20419	Reconstruct Ditch Left for 200'	Mile	0.04
	62503	Seed and mulch material hauled to waste area	SY	17
0.51	**Road 7305 Right**			
0.60 to 0.70	20419	Reconstruct Ditch Left for 525'	Mile	0.10
	62503	Seed and mulch material hauled to waste area	SY	44
0.80	**Road 7300110 Left**			
0.95 to 1.32	20419	Reconstruct Ditch Left for 1950'	Mile	0.37
	62503	Seed and mulch material hauled to waste area	SY	163
0.97	Existing Culvert			
	25101A	Place 2 & 3 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	5
	60790	Recondition culvert catch basin and inlet	EA	1
1.10	Existing Culvert			
	25101A	Place 2 & 3 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	5
		Narrow roadway, maintain existing white carsonite markers		
1.30	Existing Gate			
1.32	Existing Culvert			
	25101A	Place 2 tons Class 5 Riprap for inlet headwall	Ton	2
1.33	**Road 7315 Left**			
1.34	Existing Culvert			
1.54	Existing Culvert			
1.62	Existing Culvert			
1.71	Existing Culvert			
	25101A	Place 3 & 5 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	8
1.77	60275B	Install new 24" x 30' Culvert (125deg Skew, 5% gradient)	LF	30
	20419	Construct 35' outlet ditch	Mile	0.007
	20950	Place culvert bedding material	Ton	4
	25101A	Place 2 & 3 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	5
	32201	Place crushed aggregate surfacing	Ton	5
	62503	Seed and mulch disturbed soil	SY	84

WHITEWATER THIN TIMBER SALE **WORK DESCRIPTION LIST**			SHEET 8	OF 31
Rd. #7300 - MP 0.00 to 2.32				
Mile Post	***Item***	***Description***	***Units***	***Estimated Quantity***
	Specified Road Work on Road 7300 - CONTINUED			
1.85	20301A	Remove existing 24" culvert	EA	1
	60275C	Install new 36" x 55' Culvert (90deg Skew, 5% gradient)	LF	55
	20950	Place culvert bedding material	Ton	4
	25101A	Place 2 & 3 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	5
	32201	Place crushed aggregate surfacing	Ton	5
	62503	Seed and mulch disturbed soil	SY	44
1.85	**Road 7320 Right**			
2.04	Existing Culvert			
2.20	Existing 30" Culvert with live stream			
	25101A	Place 60 Tons Class 5 Riprap for outlet headwall and apron	Ton	60
2.21	Existing Culvert			
2.32	60275B	Install new 24" x 40' Culvert (90deg Skew, 5% gradient)	LF	40
	20950	Place culvert bedding material	Ton	4
	25101A	Place 2 & 3 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	5
	32201	Place crushed aggregate surfacing	Ton	5
	62503	Seed and mulch disturbed soil	SY	44
2.32	**End of Specified Road Work on Road 7300**			

WHITEWATER THIN TIMBER SALE

WORK DESCRIPTION LIST

SHEET 9 OF 31

Rd. #7300145 - MP 0.00 to 0.35

Mile Post	*Item*	*Description*	*Units*	*Estimated Quantity*
0.00	**Begin Specified Road Work for Road 7300145,** (Jct. with Road 7300, MP 2.32)			
0.00 to 0.35	23050C	Begin Roadside Brushing	Mile	0.35
0.00 to 0.35	30322B	Begin Road Reconditioning	Mile	0.35
0.03	60275B	Install new 24" x 30' Culvert (90deg skew, 5% gradient)	LF	30
	20950	Place culvert bedding material	Ton	4
	25101A	Place 2 & 3 ton Class 5 Riprap for inlet headwall and outlet apron	Ton	5
	32201	Place crushed aggregate surfacing	Ton	5
	62503	Seed and mulch disturbed soil	SY	44
0.05	Existing 24" Culvert			
	25101A	Install 15 ton Class 5 riprap headwall and apron at outlet	Ton	15
0.17	Existing 24" Culvert			
	25101A	Install 10 ton Class 5 riprap headwall and apron at outlet	Ton	10
0.18	**Spur Road Right**			
0.27	20301A	Remove existing 18"x30'	EA	1
	60275C	Install new 36" x 30' Culvert (90deg skew, 5% gradient)	LF	30
	20401	Import unclassified borrow to replace lost fill	CY	10
	20950	Place culvert bedding material	Ton	5
	25101A	Place 3 & 5 ton Class 5 Riprap for inlet headwall and outlet apron	Ton	8
	32201	Place crushed aggregate surfacing	Ton	7
	62503	Seed and mulch disturbed soil	SY	44
0.35	20105	Clear and grub area for 20' radius turnaround	SY	140
	20401	Construct turnaround for a 20' radius turnaround	CY	50
	20419	Construct 200' ditch across upper end of turnout from spur road right	Mile	0.04
	32201	Place crushed aggregate surfacing	Ton	45
	62503	Seed and mulch disturbed soil	SY	150
	End of Specified Road Work on Road 7305145			

WHITEWATER THIN TIMBER SALE **WORK DESCRIPTION LIST**			SHEET 10	OF 31
Rd. #7305 - MP 0.00 to 1.93				
Mile Post	***Item***	***Description***	***Units***	***Estimated Quantity***
0.00	**Begin Specified Road Work for Road 7305,** (Jct. with Road 7300, MP 0.50)			
0.00 to 1.93	23050B	Begin Roadside Brushing	Mile	1.93
0.00 to 1.93	30322A	Begin Road Reconditioning	Mile	1.93
0.02	Existing Culvert			
0.10	Existing Bridge and Water Withdrawal Location			
0.10	32201	Place Crushed Aggregate Surfacing	Ton	15
0.12 to 0.16	20419	Reconstruct Ditch Left for 200'	Mile	0.04
	62503	Seed and mulch material hauled to waste area	SY	17
0.30	**Road 7305101 Left, Helcopter Landing, and Disposal Site**			
0.42	**Temporary Connector Road Right to Road 7305110**			
0.48 to 0.59	20419	Reconstruct Ditch Right for 580'	Mile	0.11
	62503	Seed and mulch material hauled to waste area	SY	48
0.60	Existing Culvert			
0.63	Existing Culvert			
0.68	32201	Place Crushed Aggregate Surfacing	Ton	15
0.77	Existing Culvert			
0.78 to 0.98	20419	Reconstruct Ditch Right for 1050'	Mile	0.20
	62503	Seed and mulch material hauled to waste area	SY	34
0.98	Existing Culvert			
1.06	Existing Culvert			
1.07	Existing Culvert			
1.10	Existing 42"x78" Culvert with Live Stream			
1.16	**Road 7305200 Left**			
1.19	32201	Place Crushed Aggregate Surfacing	Ton	45
1.21	60275A	Install new 18" x 30' Culvert	LF	30
	20950	Place culvert bedding material	Ton	3
	25101A	Place 2 & 3 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	5
	32201	Place crushed aggregate surfacing	Ton	5
	62503	Seed and mulch disturbed soil	SY	44
1.22 to 1.52	20419	Reconstruct Ditch Right for 1580'	Mile	0.30
	62503	Seed and mulch material hauled to waste area	SY	51
1.52	Existing Culvert			
1.62 to 1.85	20401	Excavation, widen roadway 2' to 3' for 1200'	CY	507
	62503	Seed and mulch material hauled to waste area	SY	507
1.91	**Road 7305210 Right**			
1.93	**End of Specified Road Work on Road 7305**			

WHITEWATER THIN TIMBER SALE

WORK DESCRIPTION LIST

SHEET 11 OF 31

Rd. #7305110 - MP 0.18 to 0.56

Mile Post	*Item*	*Description*	*Units*	*Estimated Quantity*
0.18	**Begin Specified Road Work for Road 7305110,** (End of temporary connector road)			
0.18 to 0.56	23050C	Begin Roadside Brushing	Mile	0.38
0.18 to 0.56	30322B	Begin Road Reconditioning	Mile	0.38
0.22	**Spur Road Left**			
0.23	20301A	Remove existing 18"x20' culvert	EA	1
	60275A	Install new 18" x 20' Culvert (same skew and gradient)	LF	20
	20950	Place culvert bedding material	Ton	2
	25101A	Place 2 ton Class 5 Riprap for inlet headwall	Ton	2
	32201	Place crushed aggregate surfacing	Ton	3
	62503	Seed and mulch disturbed soil	SY	44
0.30	60275A	Install new 18" x 30' Culvert (110deg Skew, 5% gradient)	LF	30
	20950	Place culvert bedding material	Ton	3
	25101A	Place 2 & 3 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	5
	32201	Place crushed aggregate surfacing	Ton	5
	62503	Seed and mulch disturbed soil	SY	44
0.38	60275A	Install new 18" x 30' Culvert (110deg Skew, 5% gradient)	LF	30
	20950	Place culvert bedding material	Ton	3
	25101A	Place 2 & 3 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	5
	32201	Place crushed aggregate surfacing	Ton	5
	62503	Seed and mulch disturbed soil	SY	44
0.41	20401	Excavation for truck turn around	CY	50
	62503	Seed and mulch disturbed soil	SY	80
	62503	Seed and mulch material hauled to waste area	SY	50
0.47	60275A	Install new 18" x 40' Culvert (90deg Skew, 5% gradient)	LF	40
	20950	Place culvert bedding material	Ton	4
	25101A	Place 2 & 3 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	5
	32201	Place crushed aggregate surfacing	Ton	5
	62503	Seed and mulch disturbed soil	SY	44
0.56	**End of Specified Road Work on Road 7305110**			

WHITEWATER THIN TIMBER SALE **WORK DESCRIPTION LIST**			SHEET 12	OF 31
Rd. #7305210 - MP 0.00 to 0.16				
Mile Post	***Item***	***Description***	***Units***	***Estimated Quantity***
0.00	**Begin Specified Road Work for Road 7305210,** (Jct. with Road 7305, MP 1.95)			
0.00 to 0.16	23050A	Begin Roadside Brushing	Mile	0.16
0.00 to 0.16	30322A	Begin Road Reconditioning	Mile	0.16
0.00	20401	Remove berm at beginning of road (Save for re-install at end of project)	CY	50
	62503	Seed and mulch material hauled to waste area	SY	5
0.01	20420	Construct Drivable Dip to prevent water from flowing to road 7305	CY	15
	25101B	Place 4" angular rock	Ton	25
	25101A	Construct Class 5 riprap apron	Ton	5
	32201	Crushed Aggregate Surfacing	Ton	20
	62503	Seed and mulch material hauled to waste area	SY	15
0.05	20301B	Remove two large rocks (replace for post haul treatment)	EA	2
0.07	20420	Construct Drivable Dip	CY	15
	25101B	Place 4" angular rock	Ton	8
	25101A	Construct Class 5 riprap apron	Ton	5
	32201	Crushed Aggregate Surfacing	Ton	20
	62503	Seed and mulch material hauled to waste area	SY	15
0.09	20401	Excavation, shift roadway 5' into hill side for 50'	CY	100
	32201	Crushed Aggregate Surfacing	Ton	5
	62503	Seed and mulch disturbed soil	SY	120
	62503	Seed and mulch material hauled to waste area	SY	100
0.16	**End of Specified Road Work on Road 7305210**			

WHITEWATER THIN TIMBER SALE **WORK DESCRIPTION LIST**			SHEET 13	OF 31
Rd. #7315	**MP 0.00 to 2.68**			
Mile Post	***Item***	***Description***	***Units***	***Estimated Quantity***
0.00	**Begin Specified Road Work for Road 7315,** (Junction with Road 7300, MP 1.33)			
0.00 to 2.68	23050A	Begin Roadside Brushing	Mile	2.68
0.00 to 2.68	30322A	Begin Road Reconditioning	Mile	2.68
0.14	Existing 18" Culvert			
0.25	**Road Left, Proposed Helicopter Landing**			
0.28	**Spur Road Right**			
0.30	Existing 24" Culvert			
0.41	Existing 18" Culvert			
0.50	Existing 18" Culvert			
0.51	Existing 24" Culvert			
0.52	Turnout Left			
0.60	Existing 18" Culvert			
0.72	Existing 18" Culvert			
0.84	Existing 18" Culvert			
0.88 to 0.98	20419	Reconstruct Ditch Right for 525'	Mile	0.10
	62503	Seed and mulch material hauled to waste area	SY	17
0.98	Existing 18" Culvert			
1.15	Turnout Left, Disposal Site			
1.16	Existing 18" Culvert			
1.32	Existing 18" Culvert			
1.46	Turnout Right, Existing 18" Culvert			
1.60	**Spur Road Right,** Existing 18" Culvert			
1.60 to 1.68	20419	Reconstruct ditch Right for 425'	Mile	0.08
	62503	Seed and mulch material hauled to waste area	SY	35
1.76	Existing 18" Culvert			
1.93	Existing 18" Culvert			
1.99	**Spur Road Left, Disposal Site**			
2.00	**Intersection with Road 7315310 Right, Spur Road Left**			
2.01	Existing 18" Culvert			
2.02	Existing Gate			
2.10	Existing 18" Culvert			
2.23	Existing 18" Culvert			
	25101A	Construct Class 5 Riprap Headwall at Outlet	Ton	3
2.35	Existing 18" Culvert			

WHITEWATER THIN TIMBER SALE **WORK DESCRIPTION LIST**			SHEET 14	OF 31
Rd. #7315	**MP 0.00 to 2.68**			
Mile Post	***Item***	***Description***	***Units***	***Estimated Quantity***
	Specified Road Work for Road 7315 - CONTINUED			
2.36	20301A	Abondon existing 24" x 80' Culvert, Crush 10' of Inlet	EA	1
	60275C	Install new 36" x 55' Culvert (Skew 90°, gradient -9%)	LF	55
	20950	Place culvert bedding material	Ton	9
	25101A	Place 3 & 5 tons of Class 5 Riprap for inlet headwall and outlet apron	Ton	8
	32201	Place crushed aggregate for surface rock replacement	Ton	10
	62503	Seed and mulch disturbed soil	SY	44
2.41	**Intersection with Road 7315410 Left**			
2.49	Existing 18" Culvert			
2.51	Turnout Right			
2.57	Existing 18" Culvert			
2.68	Existing 18" Culvert			
2.65	**Wide Area and Turnaround**			
2.68	**End of Specified Road Work for Road 7315**			
	Existing 18" Culvert			

WHITEWATER THIN TIMBER SALE **WORK DESCRIPTION LIST**			SHEET 15	OF 31
Rd. #7315310 - MP 0.00 to 1.40				
Mile Post	***Item***	***Description***	***Units***	***Estimated Quantity***
0.00	**Begin Specified Road Work for Road 7315310,** (Junction with Road 7315, MP 2.00)			
0.00 to 1.40	23050C	Begin Roadside Brushing	Mile	1.40
0.00 to 1.40	30322B	Begin Road Reconditioning	Mile	1.40
0.00 to 1.40	20419	Intermittent ditch reconstruction as needed (approximately 0.4 miles)	Mile	0.40
	62503	Seed and mulch material hauled to waste area	SY	67
0.04	Existing Gate			
0.09	Existing 18" Culvert			
0.38	Existing 18" Culvert			
0.40	Turnout Right			
0.49	25101A	Place 3 Ton Class 5 Riprap at inlet headwall	Ton	3
	60790	Recondition culvert catch basin and inlet	EA	1
0.69	Existing 18" Culvert			
0.85	Existing 36" Culvert			
0.99	Existing 36" Culvert			
1.03	Turnout Right			
1.10	Turnout Left			
	Existing 18" Culvert			
1.12	Existing Turnout Right 28' Wide, Unclassified Borrow Source			
	20105	Clear and grub area for turnaround	SY	100
	20401	Widen Roadway for turnaround, excavate 20' into cut slope	CY	200
	32201	Place crushed aggregate surfacing	Ton	60
	62503	Seed and mulch disturbed soil	SY	80
	62503	Seed and mulch material hauled to waste area	SY	200
1.18	Existing 18" Culvert			
1.26	Turnout Right			
	Existing 18" Culvert with Flume			
1.40	**End of Specified Road Work on Road 7315310**			

WHITEWATER THIN TIMBER SALE

WORK DESCRIPTION LIST

SHEET 16 OF 31

Rd. #7315410 - MP 0.00 to 0.38

Mile Post	*Item*	*Description*	*Units*	*Estimated Quantity*
0.00	**Begin Specified Road Work for Road 7315410,** (Jct. with Road 7315, MP 2.41)			
0.00 to 0.38	23050B	Begin Roadside Brushing	Mile	0.38
0.00 to 0.38	30322A	Begin Road Reconditioning	Mile	0.38
0.00	Existing 18" Culvert			
0.05	60790	Recondition culvert catch basin and inlet	EA	1
0.13	60790	Recondition culvert catch basin and inlet	EA	1
0.15	60275B	Install new 24" x 35' Culvert (110deg Skew, 5% gradient)	LF	35
	20950	Place culvert bedding material	Ton	5
	25101A	Place 2 & 3 tons Class 5 Riprap for inlet headwall and outlet apron	Ton	5
	32201	Place crushed aggregate surfacing	Ton	6
	62503	Seed and mulch disturbed soil	SY	44
0.33	Existing 18" Culvert			
0.37	20420	Construct Drivable Diip	CY	15
	25101B	Place 4" angular rock	Ton	8
	25101A	Construct Class 5 riprap apron	Ton	5
	32201	Place crushed aggregate surfacing	Ton	20
	62503	Seed and mulch material hauled to waste area	SY	2
0.38	20401	Excavation, excavate 10' into hillside for truck turnaround	CY	100
	20105	Clear and grub area for turnaround	SY	100
	62503	Seed and mulch disturbed soil	SY	100
	62503	Seed and mulch material hauled to waste area	SY	100
0.38	**End of Specified Road Work on Road 7315410**			

WHITEWATER THIN TIMBER SALE **WORK DESCRIPTION LIST**			SHEET 17	OF 31
Rd. #7320 - MP 0.00 to 2.00				
Mile Post	***Item***	***Description***	***Units***	***Estimated Quantity***
0.00	**Begin Specified Road Work for Road 7320,** (Jct. with Road 7300, MP 1.85)			
0.00 to 2.00	23050A	Begin Roadside Brushing	Mile	2.00
0.00 to 2.00	30322A	Begin Road Reconditioning	Mile	2.00
0.08	Existing 24" Culvert			
0.10	63358	Existing Bridge, install object markers 1-OM Left and 1-OM Right	EA	2.00
0.12	32201	Place Crushed Aggregate Surfacing	Ton	30
0.25	Existing Culvert			
0.38	60790	Recondition culvert inlet and catch basin	EA	1
0.40	**Road 7305200 Right**			
0.46	Existing Culvert			
0.55	Existing Culvert			
0.58	Existing Culvert			
0.64	Existing Culvert			
0.67	Existing 48" Culvert			
0.73	60501	Install Underdrain, 24' Long	LF	24
	32201	Place Crushed Aggregate Surfacing	Ton	15
0.83	32201	Place Crushed Aggregate Surfacing	Ton	8
0.98	Existing Culvert			
1.12	Existing Culvert			
1.12	Disposal Area Left			
1.12 to 1.25	20419	Reconstruct Ditch Left for 670'	Mile	0.13
	62503	Seed and mulch material hauled to waste area	SY	56
1.25	Existing Culvert			
1.43	Existing Culvert			
1.52	Existing Culvert			
1.74 to 1.75	32201	Place Crushed Aggregate Surfacing	Ton	120
1.79	Existing Culvert			
1.79 to 1.88	20419	Reconstruct Ditch Left for 580'	Mile	0.11
	62503	Seed and mulch material hauled to waste area	SY	48
1.93	Existing Culvert			
2.00	**End of Specified Road Work on Road 7320**			

WHITEWATER THIN TIMBER SALE

DRAINAGE LISTING

SHEET	OF
18	31

(See the work summary sheets for work description at each location.)

Design		As Built		Allowable Alternatives		Installation Details								Remarks
Mile Post	L.F.	Mile Post	L.F.	All Pipes Shall Be Plastic Unless Otherwise Specified: Dia. in Inches	All Pipes Shall Be Plastic Unless Otherwise Specified: Corrugations if Metal Pipe is Specified	Type	Grade %	Skew Deg.	Headwall Ditchdam (Ton)	Outlet Apron	Bedding (Ton)	Elbow	Anchor Sets	*Place Class 7 Riprap **Place Class 8 Riprap All Others Class 5 Riprap
ROAD 7300 DRAINAGE LISTING														
0.97	Existing Culvert			18					2	3				Clean out catch basin and inlet
1.10	Existing Culvert			18					2	3				
1.32	Existing Culvert			18					2					
1.34	Existing Culvert													
1.54	Existing Culvert													
1.62	Existing Culvert													
1.71	Existing Culvert			18					3	5				
1.77	30			24		3	5	125	2	3	4			
1.85	55			36		3	5	90	2	3	4			
2.04	Existing Culvert													
2.20	Existing Culvert			30						60				Live stream, construct outlet headwall/apron
2.21	Existing Culvert													
2.32	40			24		3			2	3	4			

WHITEWATER THIN TIMBER SALE

DRAINAGE LISTING

SHEET	OF
19	31

(See the work summary sheets for work description at each location.)

Design		As Built		Allowable Alternatives		Installation Details								Remarks
Mile Post	L.F.	Mile Post	L.F.	All Pipes Shall Be Plastic Unless Otherwise Specified: Dia. in Inches	All Pipes Shall Be Plastic Unless Otherwise Specified: Corrugations if Metal Pipe is Specified	Type	Grade %	Skew Deg.	Headwall Ditchdam (Ton)	Outlet Apron	Bedding (Ton)	Elbow	Anchor Sets	*Place Class 7 Riprap **Place Class 8 Riprap All Others Class 5 Riprap
ROAD 7300145 DRAINAGE LISTING														
0.03	30			24		1	5	90	2	3	4			Live stream
0.05	Existing Culvert			24						15				Live stream construct outlet headwall/apron
0.17	Existing Culvert			24						10				Construct outlet headwall/apron
0.27	30			36		1	5	90	3	5	5			Remove existing 18" culvert, replace lost roadway fill
ROAD 7305 DRAINAGE LISTING														
0.02	Existing Culvert													
0.60	Existing Culvert													
0.63	Existing Culvert													
0.77	Existing Culvert													
0.98	Existing Culvert													
1.06	Existing Culvert													
1.07	Existing Culvert													
1.10	Existing 42"x78" Culvert with Live Stream													
1.21	30			18		1			2	3	3			
1.52	Existing Culvert													

WHITEWATER THIN TIMBER SALE

DRAINAGE LISTING

(See the work summary sheets for work description at each location.)

Design		As Built		Allowable Alternatives		Installation Details								Remarks
				All Pipes Shall Be Plastic Unless Otherwise Specified										
Mile Post	L.F.	Mile Post	L.F.	Dia. in Inches	Corrugations if Metal Pipe is Specified	Type	Grade %	Skew Deg.	Headwall Ditchdam (Ton)	Outlet Apron	Bedding (Ton)	Elbow	Anchor Sets	*Place Class 7 Riprap **Place Class 8 Riprap All Others Class 5 Riprap
ROAD 7305110 DRAINAGE LISTING														
0.23	20			18		3	Same	Same	2		2			Remove existing 18"x20' culvert
0.30	30			18		3	5	110	2	3	3			New culvert location
0.38	30			18		3	5	110	2	3	3			New culvert location
0.47	40			18		1	5	90	2	3	4			New culvert location
ROAD 7305200 DRAINAGE LISTING														
0.07	Existing Culvert			48										
ROAD 7305210 DRAINAGE LISTING														
No culvert work on this road														

WHITEWATER THIN TIMBER SALE

DRAINAGE LISTING

SHEET	OF
21	31

(See the work summary sheets for work description at each location.)

Design		As Built		Allowable Alternatives		Installation Details								Remarks
Mile Post	L.F.	Mile Post	L.F.	All Pipes Shall Be Plastic Unless Otherwise Specified: Dia. in Inches	All Pipes Shall Be Plastic Unless Otherwise Specified: Corrugations If Metal Pipe Is Specified	Type	Grade %	Skew Deg.	Headwall Ditchdam (Ton)	Outlet Apron	Bedding (Ton)	Elbow	Anchor Sets	*Place Class 7 Riprap **Place Class 8 Riprap All Others Class 5 Riprap
ROAD 7315 DRAINAGE LISTING														
0.14	Existing Culvert			18										
0.30	Existing Culvert			24										
0.41	Existing Culvert			18										
0.50	Existing Culvert			18										
0.51	Existing Culvert			24										
0.60	Existing Culvert			18										
0.72	Existing Culvert			18										
0.84	Existing Culvert			18										
0.98	Existing Culvert			18										
1.16	Existing Culvert			18										
1.32	Existing Culvert			18										
1.46	Existing Culvert			18										
1.60	Existing Culvert			18										
1.76	Existing Culvert			18										
1.93	Existing Culvert			18										
2.01	Existing Culvert			18										
2.10	Existing Culvert			18										
2.23	Existing Culvert			18						3				Construct riprap headwall at outlet
2.35	Existing Culvert			18										
2.36	55			36		1	9	90	3	5	9			Abondon existing 24"x80' culvert in place
2.49	Existing Culvert													
2.57	Existing Culvert													
2.68	Existing Culvert													

WHITEWATER THIN TIMBER SALE

DRAINAGE LISTING

SHEET	OF
22	31

(See the work summary sheets for work description at each location.)

Design		As Built		Allowable Alternatives		Installation Details								Remarks
Mile Post	L.F.	Mile Post	L.F.	All Pipes Shall Be Plastic Unless Otherwise Specified: Dia. in Inches	All Pipes Shall Be Plastic Unless Otherwise Specified: Corrugations if Metal Pipe is Specified	Type	Grade %	Skew Deg.	Headwall Ditchdam (Ton)	Outlet Apron	Bedding (Ton)	Elbow	Anchor Sets	*Place Class 7 Riprap **Place Class 8 Riprap All Others Class 5 Riprap
ROAD 7315310 DRAINAGE LISTING														
0.09	Existing Culvert			18										
0.38	Existing Culvert			18										
0.49	Existing Culvert			18					3					Clean out catch basin and inlet
0.69	Existing Culvert			18										
0.85	Existing Culvert			36										
0.99	Existing Culvert			36										
1.10	Existing Culvert			18										
1.18	Existing Culvert			18										
1.26	Existing Culvert			18										
ROAD 7315410 DRAINAGE LISTING														
0.00	Existing Culvert			18										
0.05	Existing Culvert			18										Clean out catch basin and inlet
0.13	Existing Culvert			18										Clean out catch basin and inlet
0.15	35			24		1	5	110	2	3	5			No existing cuvlert found
0.33	Existing Culvert													

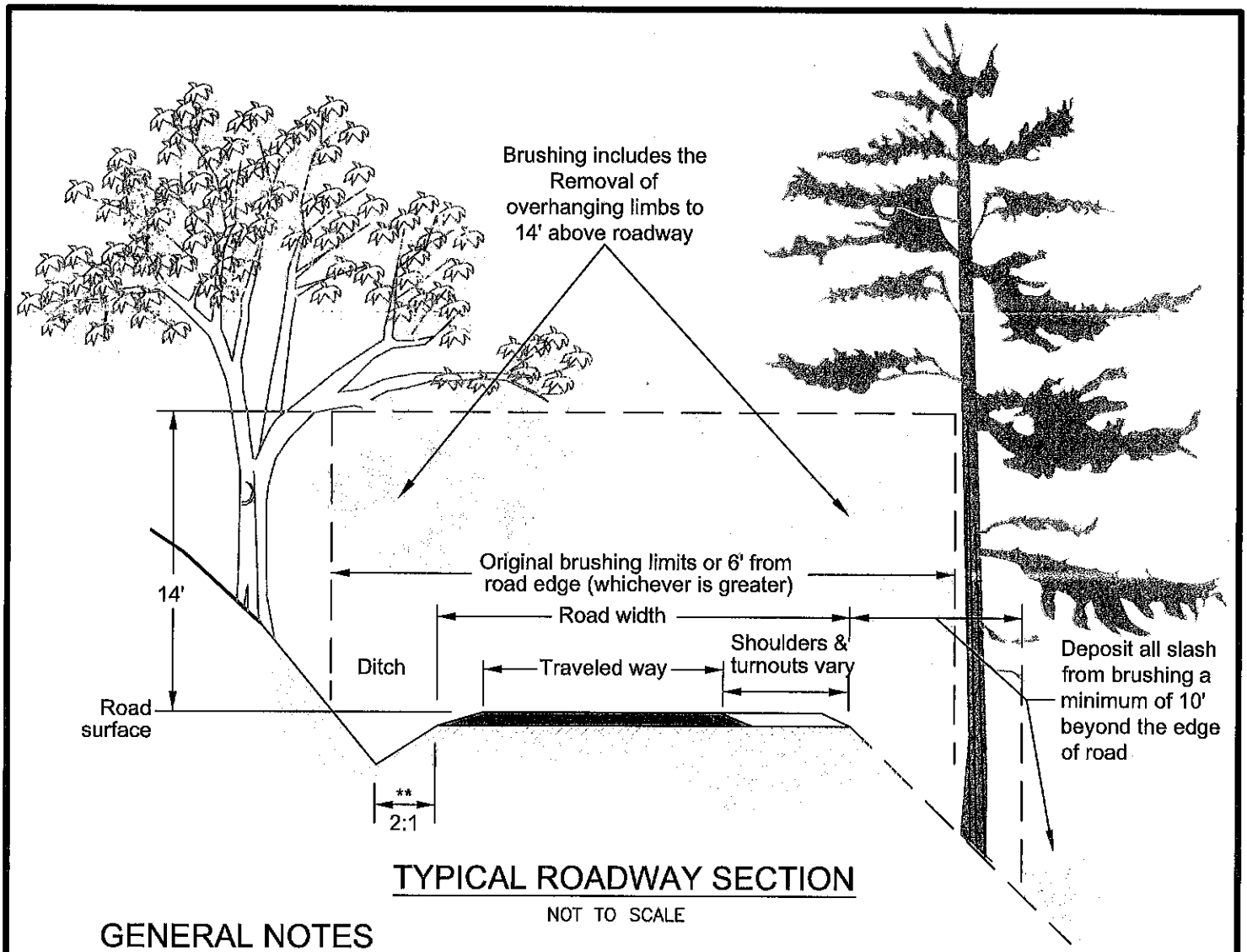
WHITEWATER THIN TIMBER SALE

DRAINAGE LISTING

SHEET	OF
23	31

(See the work summary sheets for work description at each location.)

Design		As Built		Allowable Alternatives		Installation Details								Remarks
Mile Post	L.F.	Mile Post	L.F.	All Pipes Shall Be Plastic Unless Otherwise Specified: Dia. in Inches	All Pipes Shall Be Plastic Unless Otherwise Specified: Corrugations if Metal Pipe is Specified	Type	Grade %	Skew Deg.	Headwall Ditchdam (Ton)	Outlet Apron	Bedding (Ton)	Elbow	Anchor Sets	*Place Class 7 Riprap **Place Class 8 Riprap All Others Class 5 Riprap
ROAD 7320 DRAINAGE LISTING														
0.08	Existing Culvert			24										
0.25	Existing Culvert			18										
0.46	Existing Culvert			18										
0.55	Existing Culvert			18										
0.58	Existing Culvert			18										
0.64	Existing Culvert			18										
0.67	Existing Culvert			48										
0.73	24			4"			2	90						Underdrain with 2-1/2" CleanRock and Geotextile fabric
0.98	Existing Culvert			18										
1.12	Existing Culvert			18										
1.25	Existing Culvert			18										
1.43	Existing Culvert			18										
1.52	Existing Culvert			18										
1.79	Existing Culvert			18										
1.93	Existing Culvert			18										



TYPICAL ROADWAY SECTION

NOT TO SCALE

GENERAL NOTES

** 1. Normal construction standards shown. Existing conditions in the field may vary depending on the actual shoulder and ditch constructed and maintained.

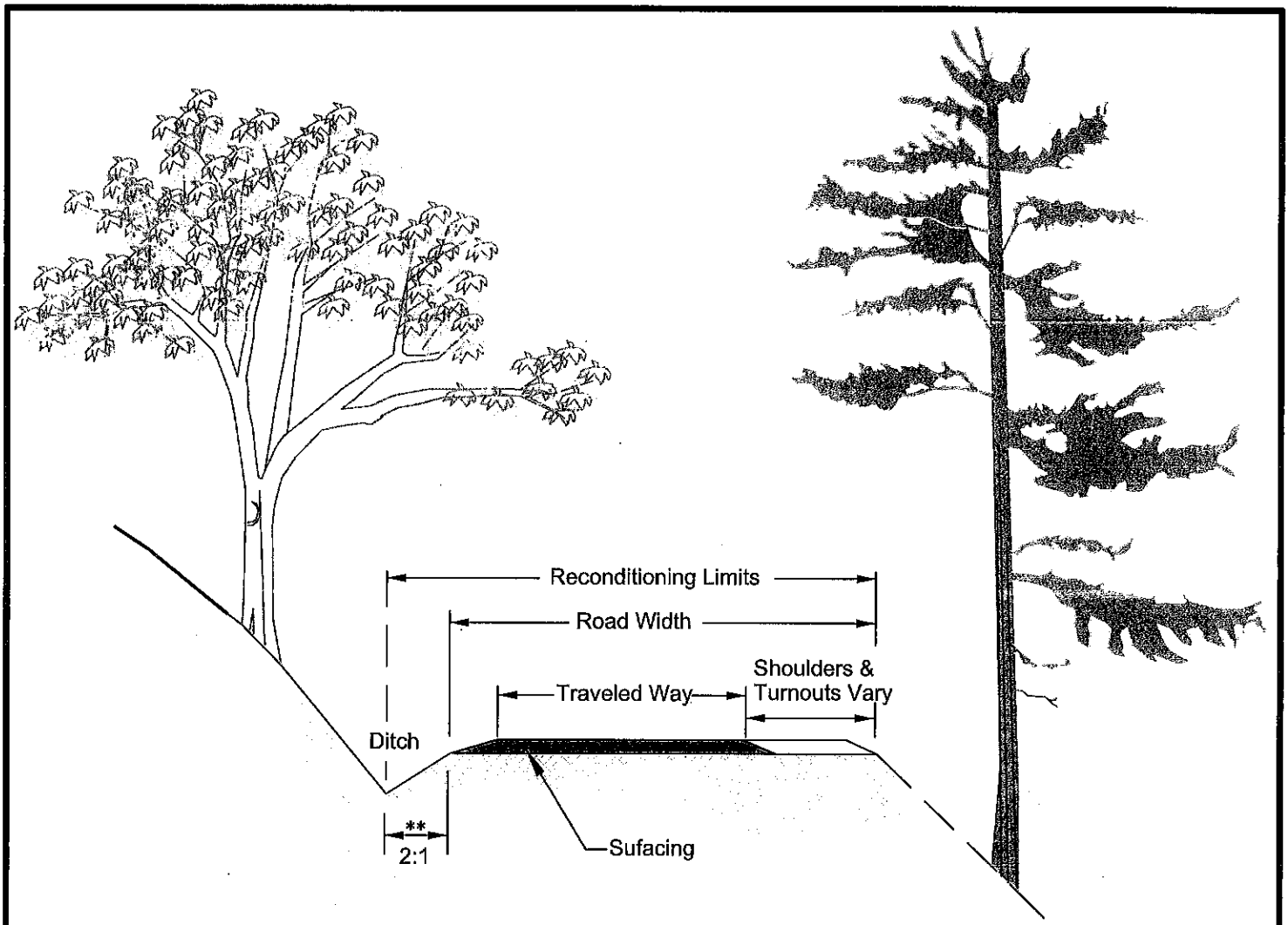
2. Scatter material a minimum of 10' beyond the edge of road along the fill slope and away from drainage areas. Do not deposit slash and debris inside the timber sale unit boundaries. Material within the timber sale unit boundaries shall be hauled to a designated waste area or scattered in the locations outside the unit boundaries.

3. All vegetation shall be cut within 6" of the ground line or protruding solid object beyond the bottom of the ditch and the roadway reconditioning limits.

4. All culvert catch basins shall be brushed a minimum of 10' radius from the culvert inlet.

5. Upon completing mechanical or hand brushing operations, all sticks and limbs larger than 1" in diameter and 18" long shall be removed from the ditchline and roadway and scattered 10' beyond the roadway.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: August 2, 2013
		SHEET: 24 OF: 31
APPROVED:	DWG NO: 23050	DRAWN BY: U. S. FOREST SERVICE
Title: WHITEWATER THIN TIMBER SALE		FILE NAME: ROAD BRUSHING



TYPICAL ROADWAY SECTION

NOT TO SCALE

GENERAL NOTES

**1. Normal construction standards shown. Existing conditions in the field may vary depending on the actual shoulder and ditch constructed and maintained.

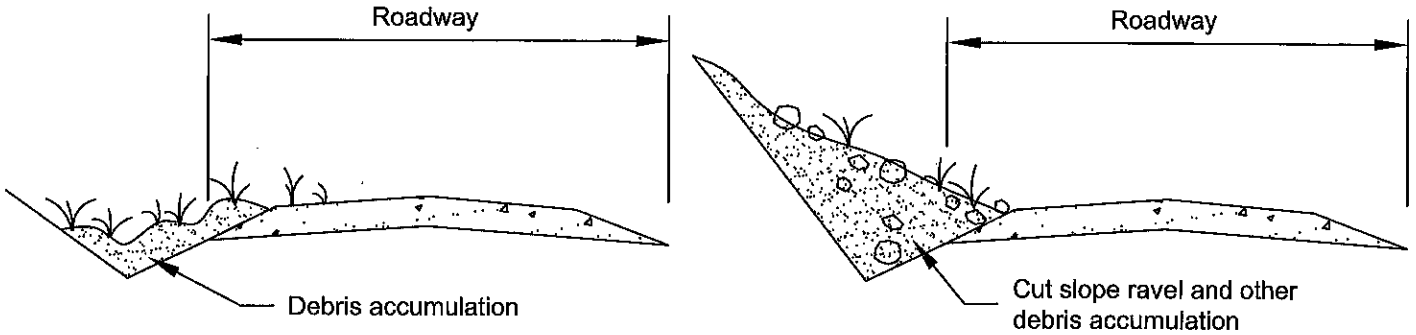
2. All culvert inlets, catch basins, and outlets shall be cleaned to allow maximum water flow.

3. All culvert outlet ditches and roadway lead-off ditches shall be cleaned and shaped to allow maximum water flow.

4. All unsuitable, excess, and oversize material generated from reconditioning the ditch or roadway shall be removed and distributed uniformly on the fill slope.

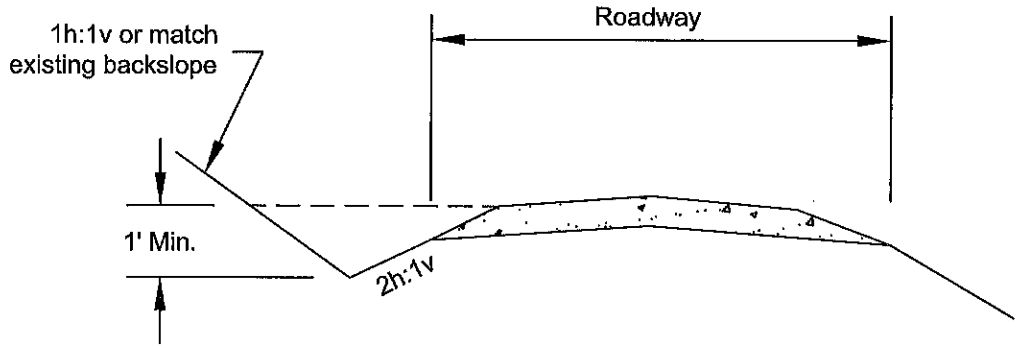
5. Roadway shoulder berms shall not be allowed.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6	DATE: August 2, 2013	
	SHEET: 25 OF: 31	
APPROVED:	DWG NO: 30322	DRAWN BY: U. S. FOREST SERVICE
Title: WHITEWATER THIN TIMBER SALE		FILE NAME: ROAD RECONDITIONING



TYPICAL DITCH DEBRIS OBSTRUCTION

NOT TO SCALE



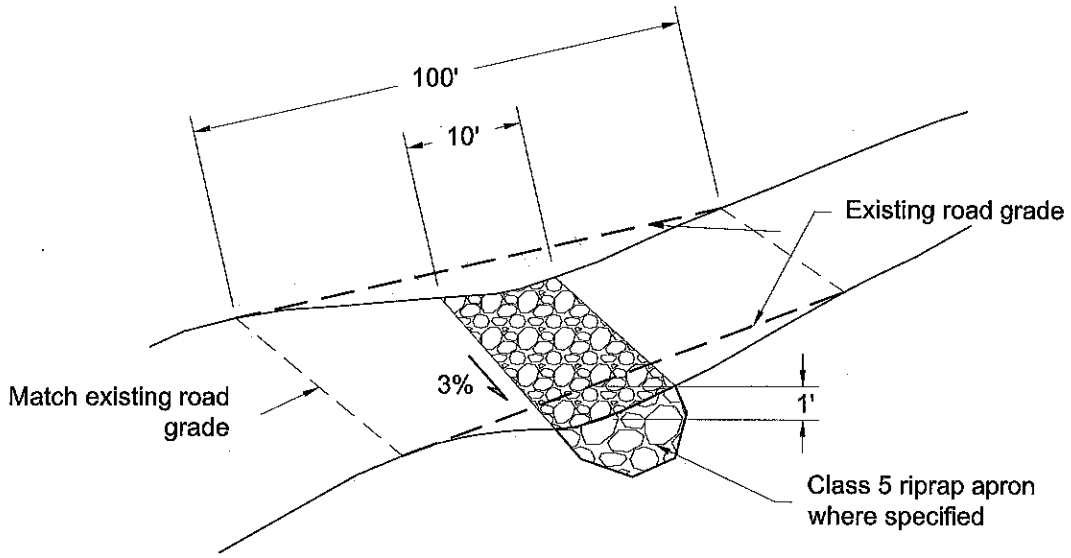
TYPICAL COMPLETED DITCH

NOT TO SCALE

NOTES:

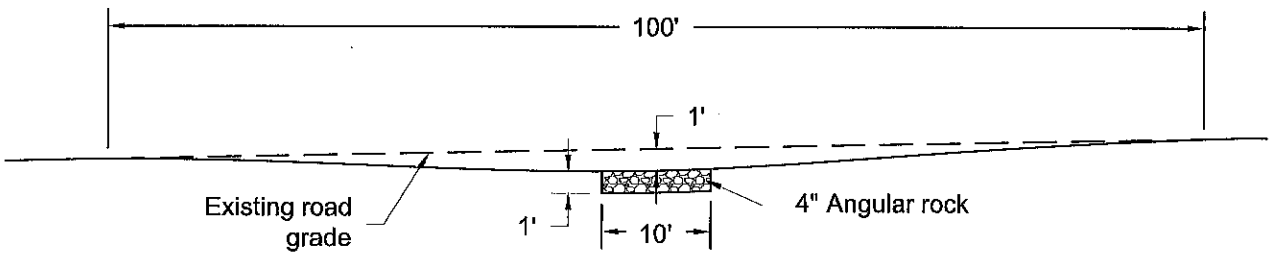
1. Restore ditches (various types) identified and staked in the field to the minimum dimensions shown or match existing ditch lines.
2. Large rock, soil, wood and other materials shall be removed.
3. Suitable material (rocks up to 2" in greatest dimension), may be blended into the roadbed of native surfaces and shoulders, or placed in designated location(s) where excess material is deposited.
4. Excess materials temporarily stored on the ditch-slope or shoulder shall be removed daily.
5. Lead-off ditches shall be shaped and sloped to drain away from the traveled-way.
6. Load and haul waste material to the designated waste areas as flagged. Consolidate by lumping waste material into 1 large pile and compact pile with track wheeled equipment prior to seed and mulching.

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: August 2, 2013
		SHEET: 26 OF: 31
APPROVED:	DWG NO: 20419	DRAWN BY: U. S. FOREST SERVICE
Title: WHITEWATER THIN TIMBER SALE		FILE NAME: DITCH RECONSTRUCTION



DRIVABLE DIP 3D TYPICAL

NOT TO SCALE



DRIVABLE DIP ELEVATION VIEW

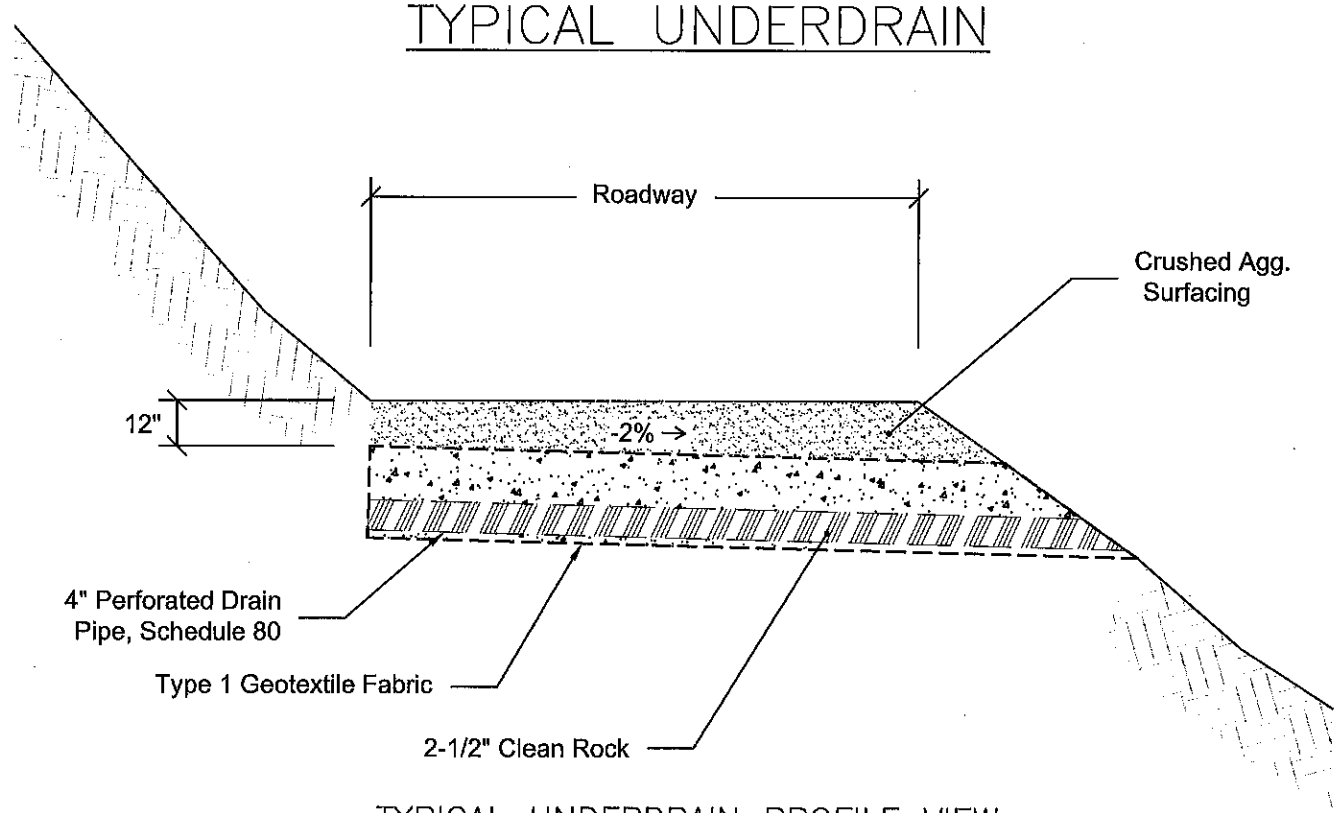
NOT TO SCALE

NOTES:

1. Finish dip elevation shall be constructed 1' below existing road grade.
2. Use 4" angular free draining rock 1' thick to line the bottom of the dip for the full width of the roadway.
3. Dip shall match alignment of exisitng dips/swales adjacent to the roadway.

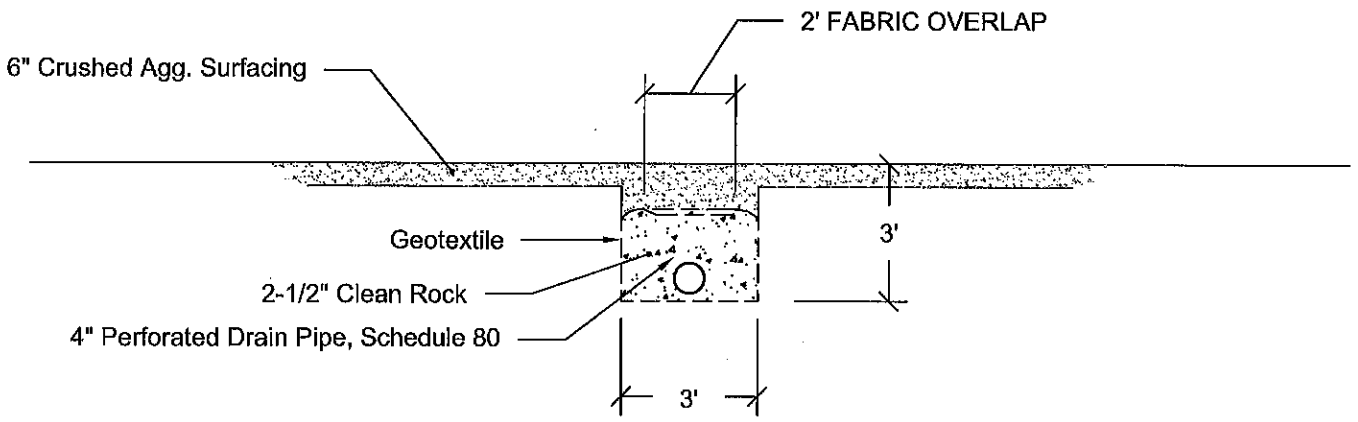
U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: August 2, 2013
		SHEET: 27 OF: 31
APPROVED:	DWG NO: 20420	DRAWN BY: U. S. FOREST SERVICE
Title: WHITEWATER THIN TIMBER SALE		FILE NAME: TYPICAL DRIVABLE DIP

TYPICAL UNDERDRAIN



TYPICAL UNDERDRAIN PROFILE VIEW

NOT TO SCALE



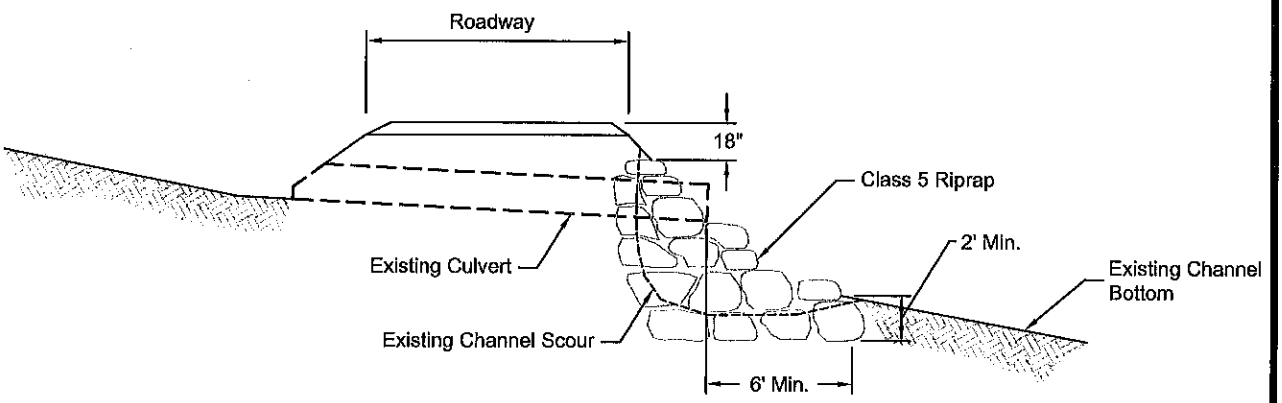
TYPICAL UNDERDRAIN END VIEW

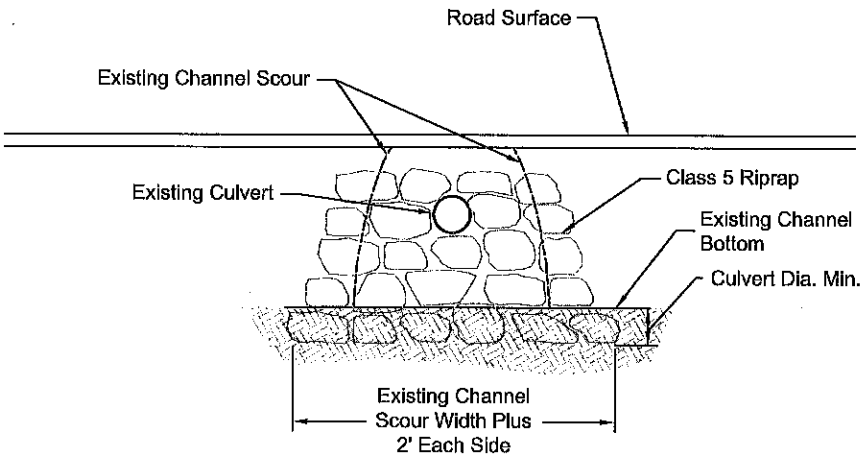
NOT TO SCALE

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: August 2, 2013
		SHEET: 28 OF: 31
APPROVED:	DWG NO: 60501	DRAWN BY: U. S. FOREST SERVICE
Title: WHITEWATER THIN TIMBER SALE		FILE NAME: TYPICAL UNDERDRAIN

TYPICAL OUTLET HEADWALL and APRON

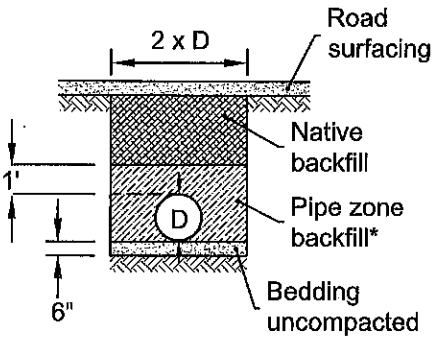
NOT TO SCALE





U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION—6		DATE: August 2, 2013
		SHEET: 29 OF: 31
APPROVED:	DWG NO: 25101	DRAWN BY: U. S. FOREST SERVICE
Title: WHITEWATER THIN TIMBER SALE		FILE NAME: TYPICAL OUTLET HEADWALL

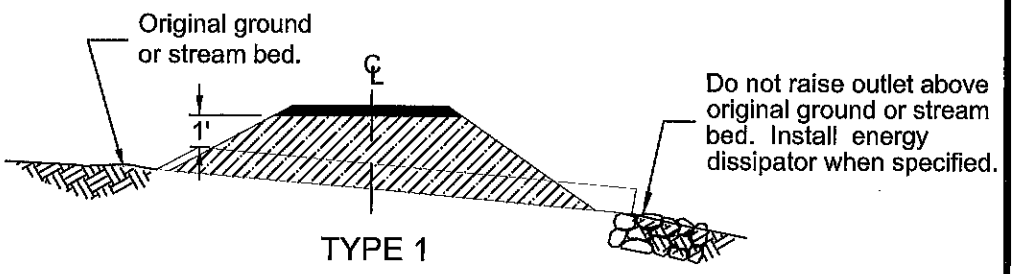
CULVERT TYPES



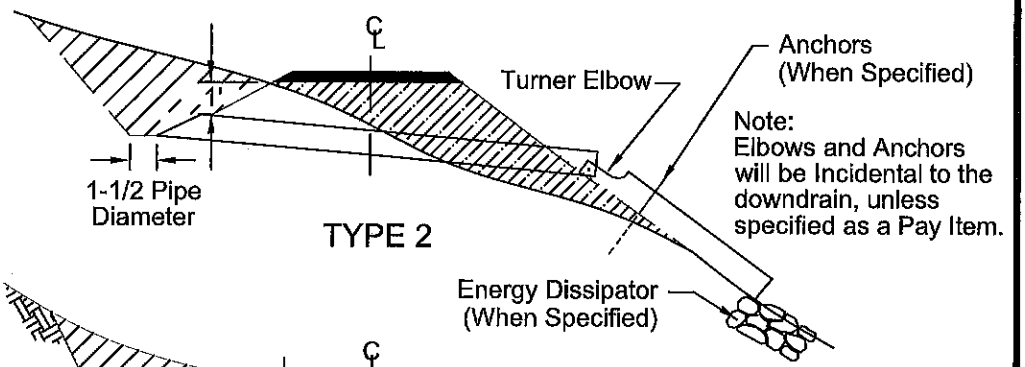
* Maximum particle size is 3", except 1-1/2" for plastic pipe

CULVERT INSTALLATION

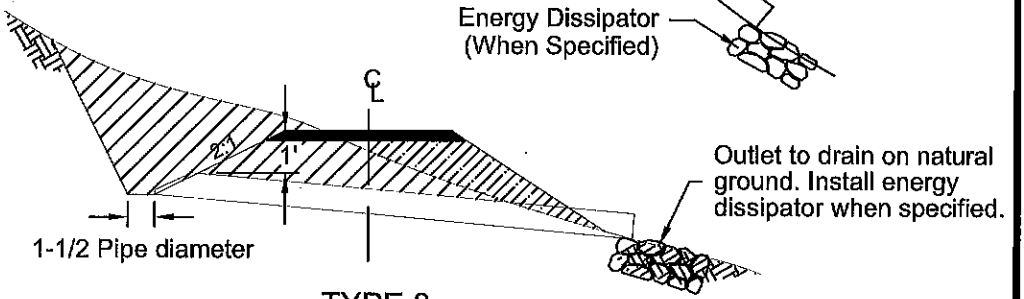
NOTE: Pipe beds shall be constructed with a positive camber before placing the pipe.



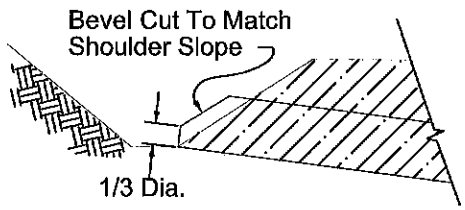
TYPE 1



TYPE 2

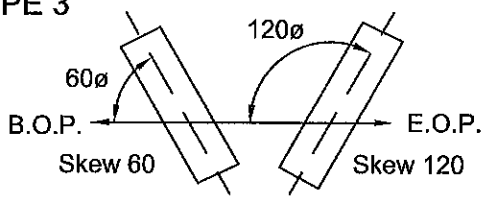


TYPE 3

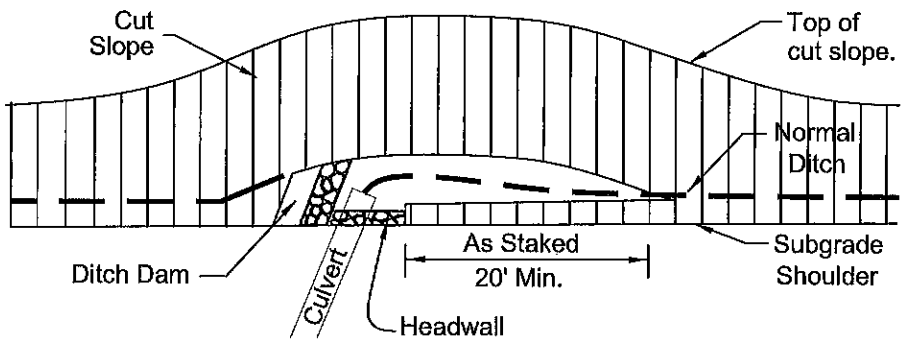


NOTE: All culverts shall be beveled at the inlet.

BEVELED INLET DETAIL



SKEW DIAGRAM



CATCH BASIN DETAIL-PLAN VIEW

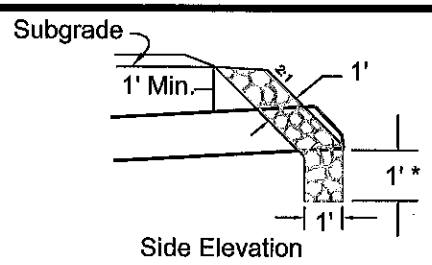
TYPE 2 & 3 CULVERT INSTALLATION

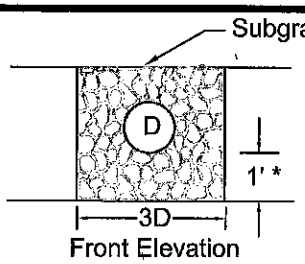
ANCHOR DESCRIPTION

Anchors (Each) shall consist of two 6' steel fence posts 1.5 lb./foot and No. 9 galvanized wire.
Posts shall be driven a minimum of 3' into the ground.
3 strands of wire shall be twisted together and encompass the entire circumference of the downpipe.
The number of Anchors sets per installation will be specified on the drawings.
1 set of Anchors will be required per 20' length of Plastic Downpipe.

NOT TO SCALE

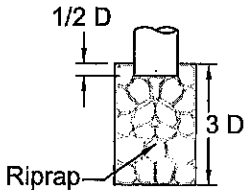
U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6	DATE: August 2, 2013	
	SHEET: 30 OF: 31	
APPROVED:	DWG NO: 60275–1	DRAWN BY: U. S. FOREST SERVICE
Title: WHITEWATER THIN TIMBER SALE		FILE NAME: DRAINAGE CONSTRUCTION DETAILS



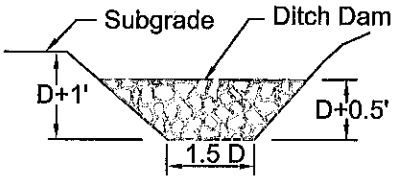


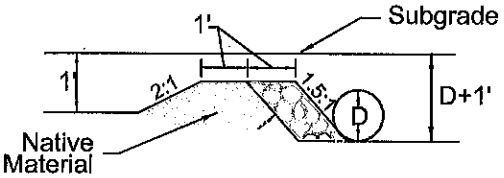
* For culvert over 24" in diameter otherwise 0'.

HAND-PLACED RIPRAP HEADWALL

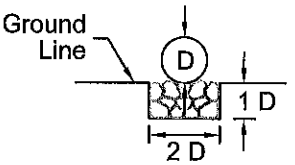


ENERGY DISSIPATOR PLAN VIEW



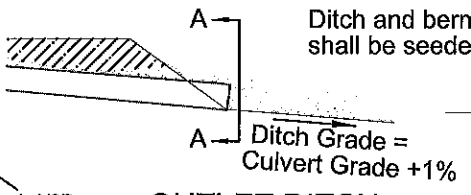


PLACED RIPRAP DITCH DAM



NOTE: Energy dissipator shall be installed prior to setting the culvert. Apron surface shall be left with protruding riprap for velocity break.

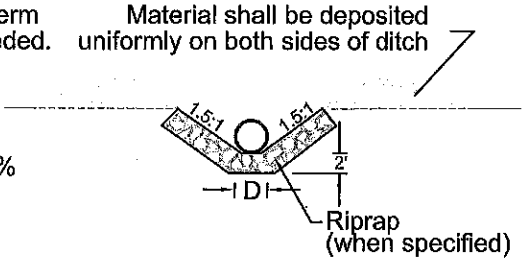
ENERGY DISSIPATOR ELEV. VIEW



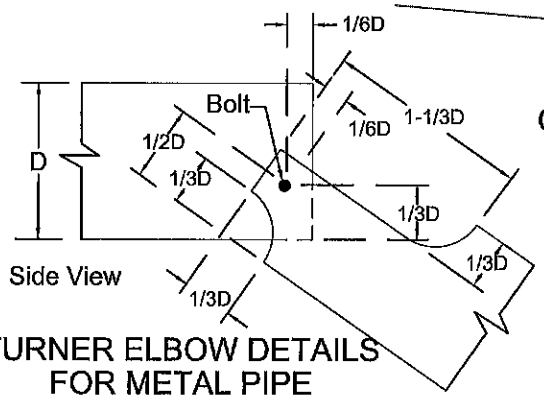
OUTLET DITCH

Ditch and berm shall be seeded.

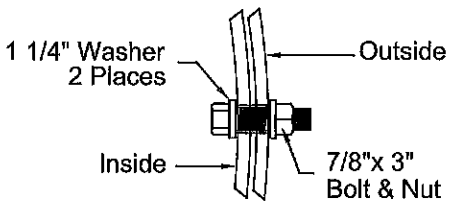
Material shall be deposited uniformly on both sides of ditch



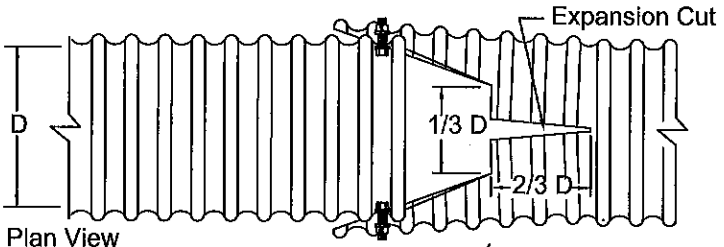
SECTION A-A OUTLET/LEAD-OFF DITCH

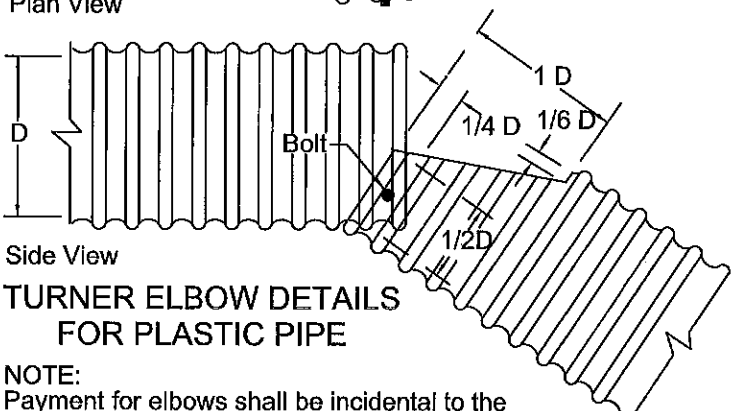


TURNER ELBOW DETAILS FOR METAL PIPE

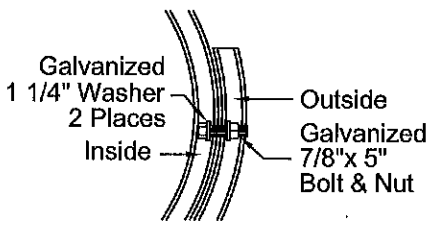


BOLT DETAIL FOR METAL PIPE





TURNER ELBOW DETAILS FOR PLASTIC PIPE



BOLT DETAIL FOR PLASTIC PIPE

NOTE:
Payment for elbows shall be incidental to the downdrain unless listed as a specific pay item.

NOT TO SCALE

U.S. DEPARTMENT OF AGRICULTURE FOREST SERVICE PACIFIC NORTHWEST REGION–6		DATE: August 2, 2013
		SHEET: 31 OF: 31
APPROVED:	DWG NO: 60275–2	DRAWN BY: U. S. FOREST SERVICE
Title: WHITEWATER THIN TIMBER SALE		FILE NAME: DRAINAGE CONSTRUCTION DETAILS

PART I - SCHEDULE OF ITEMS

Specified Road Construction **TIMBER SALE COSTS**

SECTION B - SERVICES AND PRICES

WHITEWATER THIN TIMBER SALE ROADS

Snoqualmie Ranger District
Mount Baker-Snoqualmie National Forest
Washington State, Pierce County

SUB-PROJECT: ROAD #7300, HUCKLEBERRY CREEK (Milepost 0.00 to 2.32)

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL PRICE
15101	MOBILIZATION (INCLUDES CLEANING OF EQUIPMENT, SIGNING, TRAFFIC CONTROL, SANITATION)	LS	1	$2,368.22	$2,368.22
20301A	REMOVAL OF EXISTING CULVERT	EACH	1	$77.00	$77.00
20419	DRAINAGE EXCAVATION, DITCH RECONSTRUCTION	MILE	0.62	$9,277.00	$5,723.91
20950	CULVERT BEDDING MATERIAL (COMMERCIAL SOURCE)	TON	12	$30.00	$360.00
23050A	ROADSIDE BRUSHING (NORMAL)	MILE	2.32	$740.00	$1,716.80
25101A	PLACED RIPRAP, CLASS 5 (COMMERCIAL SOURCE) FOR CULVERT INLETS & OUTLETS ON ALL ROADS	TON	95	$48.00	$4,560.00
30322A	ROAD RECONDITIONING, COMPACTION METHOD A (NORMAL)	MILE	2.22	$1,175.00	$2,608.50
32201	AGGREGATE BASE, GRADING EQUAL TO WSDOT MIX 1-1/4" MINUS, COMPACTION METHOD A (COMMERCIAL SOURCE)	TON	15	$39.00	$585.00
60275B	24-INCH HIGH DENSITY POLYETHYLNE PIPE WITH SMOOTH INTERIOR AND ANNULAR EXTERIOR, COMPACTION METHOD B	FT	70	$45.00	$3,150.00
60275C	36-INCH HIGH DENSITY POLYETHYLNE PIPE WITH SMOOTH INTERIOR AND ANNULAR EXTERIOR, COMPACTION METHOD B	FT	55	$65.00	$3,575.00
60790	RECONDITION DRAINAGE STRUCTURE	EACH	1	$66.00	$66.00
62503	SEEDING, DRY METHOD WITH MULCH (SEED MIX C1)	SY	440	$2.00	$880.00
63358	INSTALLATION OBJECT MARKERS FOR BRIDGE	EACH	2	$190.00	$380.00
				Total	$26,050.43

SUB-PROJECT: ROAD #7300110, ORCHARD (Milepost 0.00 to 0.10)

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL PRICE
NO SPEC ROAD WORK TO BE PERFORMED					
				Total	$0.00

PART I - SCHEDULE OF ITEMS

SECTION B - SERVICES AND PRICES

WHITEWATER THIN TIMBER SALE ROADS

Snoqualmie Ranger District
Mount Baker-Snoqualmie National Forest
Washington State, Pierce County
Specified Road Construction **TIMBER SALE COSTS**

SUB-PROJECT: ROAD #7305110, DICKMAN LATERAL (Milepost 0.18 to 0.56)

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL PRICE
15101	MOBILIZATION (INCLUDES CLEANING OF EQUIPMENT, SIGNING, TRAFFIC CONTROL, SANITATION)	LS	1	$847.38	$847.38
20301A	REMOVAL OF EXISTING CULVERT	EACH	1	$77.00	$77.00
20401	ROADWAY EXCAVATION, COMPACTION METHOD B, FINISHING METHOD C	CY	50	$23.00	$1,150.00
20950	CULVERT BEDDING MATERIAL (COMMERCIAL SOURCE)	TON	12	$30.00	$360.00
23050C	ROADSIDE BRUSHING (EXTRA HEAVY)	MILE	0.38	$1,575.00	$598.50
25101A	PLACED RIPRAP, CLASS 5 (COMMERCIAL SOURCE) FOR CULVERT INLETS & OUTLETS ON ALL ROADS	TON	17	$48.00	$816.00
30322B	ROAD RECONDITIONING, COMPACTION METHOD A (HEAVY)	MILE	0.38	$1,785.00	$678.30
32201	AGGREGATE BASE, GRADING EQUAL TO WSDOT MIX 1-1/4" MINUS, COMPACTION METHOD A (COMMERCIAL SOURCE)	TON	18	$39.00	$702.00
60275A	18-INCH HIGH DENSITY POLYETHYLNE PIPE WITH SMOOTH INTERIOR AND ANNULAR EXTERIOR, COMPACTION METHOD B	FT	120	$29.00	$3,480.00
62503	SEEDING, DRY METHOD WITH MULCH (SEED MIX C1)	SY	306	$2.00	$612.00
				Total	$9,321.18

SUB-PROJECT: ROAD #7305210, DICKMAN SPUR (Milepost 0.00 to 0.16)

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL PRICE
15101	MOBILIZATION (INCLUDES CLEANING OF EQUIPMENT, SIGNING, TRAFFIC CONTROL, SANITATION)	LS	1	$901.54	$901.54
20301B	REMOVAL OF LARGE ROCKS	EACH	2	$120.00	$240.00
20401	ROADWAY EXCAVATION, COMPACTION METHOD B, FINISHING METHOD C	CY	150	$23.00	$3,450.00
20420	DRAINAGE EXCAVATION, TYPE DRIVABLE DIP	CY	30	$23.00	$690.00
23050A	ROADSIDE BRUSHING (NORMAL)	MILE	0.16	$740.00	$118.40
25101A	PLACED RIPRAP, CLASS 5 (COMMERCIAL SOURCE) FOR CULVERT INLETS & OUTLETS ON ALL ROADS	TON	10	$48.00	$480.00
25101B	PLACED RIPRAP, 2-4" CLEAN (COMMERCIAL SOURCE)	TON	33	$48.00	$1,584.00
30322A	ROAD RECONDITIONING, COMPACTION METHOD A (NORMAL)	MILE	0.16	$1,175.00	$188.00
32201	AGGREGATE BASE, GRADING EQUAL TO WSDOT MIX 1-1/4" MINUS, COMPACTION METHOD A (COMMERCIAL SOURCE)	TON	45	$39.00	$1,755.00
62503	SEEDING, DRY METHOD WITH MULCH (SEED MIX C1)	SY	255	$2.00	$510.00
				Total	$9,916.94

PART I - SCHEDULE OF ITEMS

SECTION B - SERVICES AND PRICES

WHITEWATER THIN TIMBER SALE ROADS

Snoqualmie Ranger District
Mount Baker-Snoqualmie National Forest
Washington State, Pierce County
Specified Road Construction **TIMBER SALE COSTS**

SUB-PROJECT: ROAD #7315410, SKOOKUM (Milepost 0.00 to 0.38)

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL PRICE
15101	MOBILIZATION (INCLUDES CLEANING OF EQUIPMENT, SIGNING, TRAFFIC CONTROL, SANITATION)	LS	1	$823.27	$823.27
20105	CLEARING AND GRUBBING, DISPOSAL OF TOPS AND LIMBS F, LOGS F, STUMPS F	SY	100	$5.00	$500.00
20401	ROADWAY EXCAVATION, COMPACTION METHOD B, FINISHING METHOD C	CY	100	$23.00	$2,300.00
20420	DRAINAGE EXCAVATION, TYPE DRIVABLE DIP	CY	15	$23.00	$345.00
20950	CULVERT BEDDING MATERIAL (COMMERCIAL SOURCE)	TON	5	$30.00	$150.00
23050B	ROADSIDE BRUSHING (HEAVY)	MILE	0.38	$1,090.00	$414.20
25101A	PLACED RIPRAP, CLASS 5 (COMMERCIAL SOURCE) FOR CULVERT INLETS & OUTLETS ON ALL ROADS	TON	10	$48.00	$480.00
25101B	PLACED RIPRAP, 2-4" CLEAN (COMMERCIAL SOURCE)	TON	8	$48.00	$384.00
30322A	ROAD RECONDITIONING, COMPACTION METHOD A (NORMAL)	MILE	0.38	$1,175.00	$446.50
32201	AGGREGATE BASE, GRADING EQUAL TO WSDOT MIX 1-1/4" MINUS, COMPACTION METHOD A (COMMERCIAL SOURCE)	TON	26	$39.00	$1,014.00
60275B	24-INCH HIGH DENSITY POLYETHYLNE PIPE WITH SMOOTH INTERIOR AND ANNULAR EXTERIOR, COMPACTION METHOD B	FT	35	$45.00	$1,575.00
60790	RECONDITION DRAINAGE STRUCTURE	EACH	2	$66.00	$132.00
62503	SEEDING, DRY METHOD WITH MULCH (SEED MIX C1)	SY	246	$2.00	$492.00
				Total	$9,055.97

SUB-PROJECT: ROAD #7320, WEST HUCKLEBERRY (Milepost 0.00 to 2.00)

ITEM NO.	DESCRIPTION	PAY UNIT	EST. QTY.	UNIT PRICE	TOTAL PRICE
15101	MOBILIZATION (INCLUDES CLEANING OF EQUIPMENT, SIGNING, TRAFFIC CONTROL, SANITATION)	LS	1	$1,696.15	$1,696.15
20419	DRAINAGE EXCAVATION, DITCH RECONSTRUCTION	MILE	0.24	$9,277.00	$2,226.48
23050A	ROADSIDE BRUSHING (NORMAL)	MILE	2	$740.00	$1,480.00
30322A	ROAD RECONDITIONING, COMPACTION METHOD A (NORMAL)	MILE	2	$1,175.00	$2,350.00
32201	AGGREGATE BASE, GRADING EQUAL TO WSDOT MIX 1-1/4" MINUS, COMPACTION METHOD A (COMMERCIAL SOURCE)	TON	173	$39.00	$6,747.00
60501	UNDERDRAIN, 4" PERFORATED DRAIN PIPE, SCHEDULE 80, 2-1/2" CLEAN DRAIN ROCK, GEOTEXTILE TYPE 1	FT	24	$146.00	$3,504.00
60790	RECONDITION DRAINAGE STRUCTURE	EACH	1	$66.00	$66.00
62503	SEEDING, DRY METHOD WITH MULCH (SEED MIX C1)	SY	104	$2.00	$208.00
63358	INSTALLATION OBJECT MARKERS FOR BRIDGE	EACH	2	$190.00	$380.00
				Total	$18,657.63

Total All Roads TIMBER SALE Rates **TS**

Total	**$147,994.03**

Table of Contents

Preface

Preface_wo_03_15_2004_m

Delete all but the first paragraph and add the following:

The Forest Service, US Department of Agriculture has adopted FP-03 for construction of National Forest System Roads.

101 - Terms, Format, and Definitions

101.00_nat_us_07_25_2005

101.01_nat_us_01_22_2009

101.01 Meaning of Terms

Delete all references to the TAR (Transportation Acquisition Regulations) in the specifications.

101.03_nat_us_06_16_2006

101.03 Abbreviations.

Add the following to (a) Acronyms:

AFPA	American Forest and Paper Association
MSHA	Mine Safety and Health Administration
NIST	National Institute of Standards and Technology
NESC	National Electrical Safety Code
WCLIB	West Coast Lumber Inspection Bureau

Add the following to (b) SI symbols:

mp	Milepost
ppm	Part Per Million

101.04_nat_us_03_29_2007

101.04 Definitions.

Delete the following definitions and substitute the following:

Bid Schedule--The Schedule of Items.

Bridge--No definition.

Contractor--The individual or legal entity contracting with the Government for performance of prescribed work. In a timber sale contract, the contractor is the "purchaser".

Culvert--No definition.

Right-of-Way--A general term denoting (1) the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use, or traverse public or private lands), or (2) Real property necessary for the project, including roadway, buffer areas, access, and drainage areas.

Add the following:

Adjustment in Contract Price--"Equitable adjustment," as used in the Federal Acquisition Regulations, or "construction cost adjustment," as used in the Timber Sale Contract, as applicable.

Change--"Change" means "change order" as used in the Federal Acquisition Regulations, or "design change" as used in the Timber Sale Contract.

Design Quantity--"Design quantity" is a Forest Service method of measurement from the FS-96 *Forest Service Specifications for the Construction of Roads and Bridges.* Under these FP specifications this term is replaced by the term "Contract Quantities".

Forest Service--The United States of America, acting through the Forest Service, U.S. Department of Agriculture.

Neat Line--A line defining the proposed or specified limits of an excavation or structure.

Pioneer Road--Temporary construction access built along the route of the project.

Purchaser--The individual, partnership, joint venture, or corporation contracting with the Government under the terms of a Timber Sale Contract and acting independently or through agents, employees, or subcontractors.

Protected Streamcourse--A drainage shown on the plans or timber sale area map that requires designated mitigation measures.

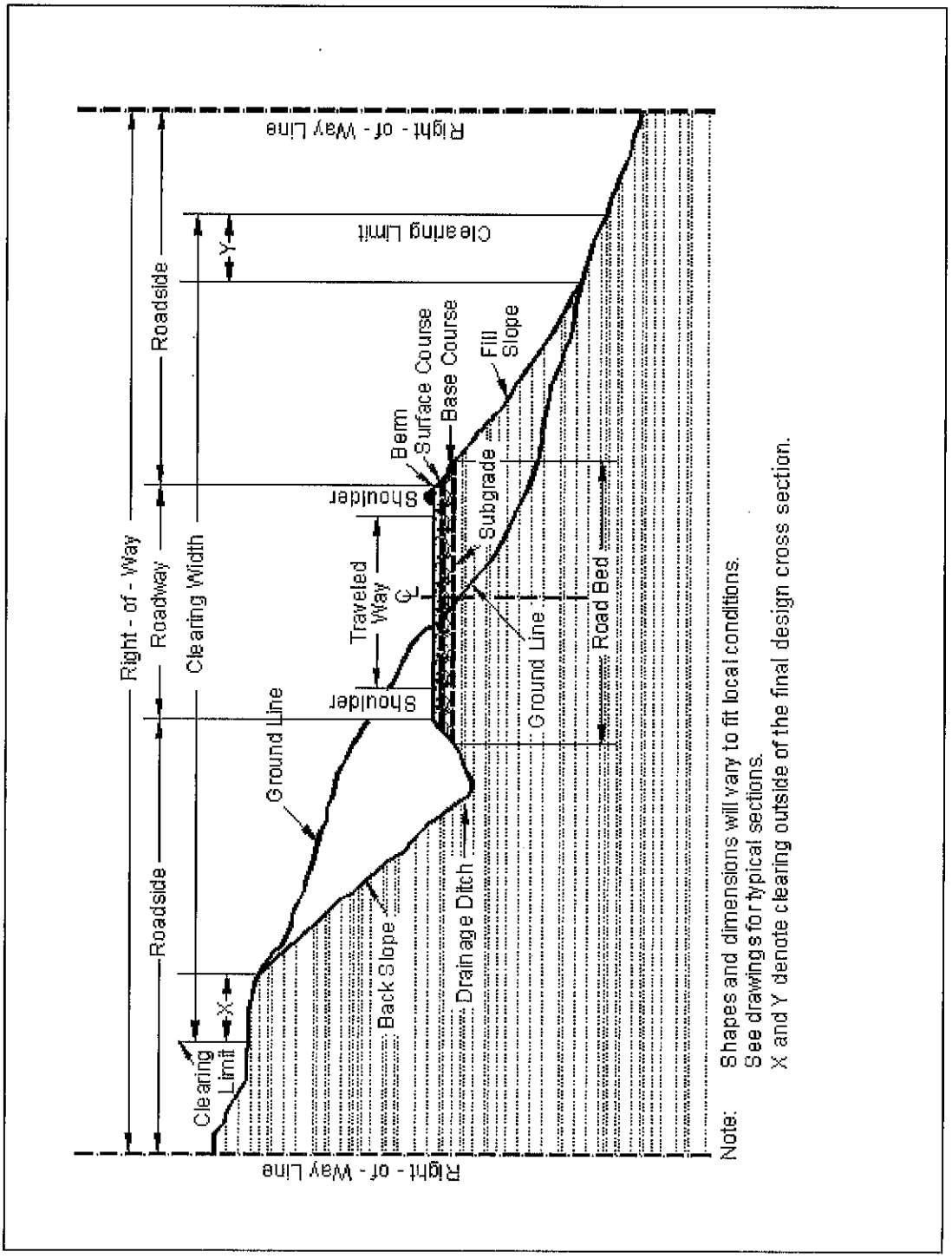
Road Order--An order affecting and controlling traffic on roads under Forest Service jurisdiction. Road Orders are issued by a designated Forest Officer under the authorities of 36 CFR, part 260.

Schedule of Items--A schedule in the contract that contains a listing and description of construction items, quantities, units of measure, unit price, and amount.

Utilization Standards--The minimum size and percent soundness of trees described in the specifications to determine merchantable timber.

Add Figure 101-1—Illustration of road structure terms:

Figure 101-1—Illustration of road structure terms.



102 Bid, Award, and Execution of Contract

Delete Section 102 in its entirety.

103 - Scope of Work

Deletions

Delete all but subsection 103.01 Intent of Contract.

104 - Control of Work

104.00_nat_us_06_16_2006

Deletions

Delete Sections 104.01, 104.02, and 104.04.

104.06_nat_us_02_17_2005

Add the following subsection:

104.06 Use of Roads by Contractor

The Contractor is authorized to use roads under the jurisdiction of the Forest Service for all activities necessary to complete this contract, subject to the limitations and authorizations designated in the Road Order(s) or described in the contract, when such use will not damage the roads or national forest resources, and when traffic can be accommodated safely.

105 - Control of Material

105.02_nat_us_01_18_2007

105.02 Material Sources.

105.02(a) Government-provided sources.

Add the following:

Comply with the requirements of 30 CFR 56, subparts B and H. Use all suitable material for aggregate regardless of size unless otherwise designated. When required, re-establish vegetation in disturbed areas according to section 625.

105.05_nat_us_05_12_2004

105.05 Use of Material Found in the Work.

Delete 105.05 (a) and (b) and the last sentence of the second paragraph and substitute the following:

Materials produced or processed from Government lands in excess of the quantities required for performance of this contract are the property of the Government. The Government is not obligated to make reimbursement for the cost of producing these materials.

106 - Acceptance of Work

106.07_nat_us_05_11_2004

106.07 Delete

Delete subsection 106.07.

107 - Legal Relations and Responsibility to the Public

107.05_nat_us_05_11_2004

107.05 Responsibility for Damage Claims.

Delete the entire subsection.

107.06_nat_us_06_16_2006

107.06 Contractor's Responsibility for Work.

Delete the following from the first paragraph.

"except as provided in Subsection 106.07".

107.09_nat_us_06_16_2006

107.09 Legal Relationship of the Parties.

Delete the entire subsection.

107.10_nat_us_06_16_2006

107.10 Environmental Protection.

Add the following:

Design and locate equipment repair shops, stationary refueling sites, or other facilities to minimize the potential and impacts of hazardous material spills on Government land.

Before beginning any work, submit a Hazardous Spill Plan. List actions to be taken in the event of a spill. Incorporate preventive measures to be taken, such as the location of mobile refueling facilities, storage and handling of hazardous materials, and similar information. Immediately notify the CO of all hazardous material spills. Provide a written narrative report form no later than 24 hours after the initial report and include the following:

- Description of the item spilled (including identity, quantity, manifest number, and other identifying information).
- Whether amount spilled is EPA or state reportable, and if so whether it was reported, and to whom.
- Exact time and location of spill including a description of the area involved.
- Containment procedures.
- Summary of any communications the Contractor had with news media, Federal, state and local regulatory agencies and officials, or Forest Service officials.
- Description of clean-up procedures employed or to be employed at the site including final disposition and disposal location of spill residue.

When available provide copies of all spill related clean up and closure documentation and correspondence from regulatory agencies.

The Contractor is solely responsible for all spills or leaks that occur during the performance of this contract. Clean up spills or leaks to the satisfaction of the CO and in a manner that complies with Federal, state, and local laws and regulations.

108 - Prosecution and Progress

108 Delete.

Delete Section 108 in its entirety.

109 - Measurement and Payment

109.00_nat_us_02_17_2005

109 Deletions

Delete the following entire subsections:

109.06 Pricing of Adjustments.

109.07 Eliminated Work.

109.08 Progress Payments.

109.09 Final Payment.

109.02_nat_us_06_16_2006

109.02 Measurement Terms and Definitions.

(b) Contract quantity.

Add the following:

Contract quantities will be adjusted only when there are errors in the original design of 15% or more.

Change the following:

"(b) Cubic yard" to "(c) Cubic yard".

Add the following definition:

(p) Thousand Board Feet (Mbf). 1,000 board feet based on nominal widths, thickness, and extreme usable length of each piece of lumber or timber actually incorporated in the job. For glued laminated timber, 1,000 board feet based on actual width, thickness, and length of each piece actually incorporated in the job.

155 - Schedules for Construction Contracts

155 Delete.

Delete Section 155 in its entirety.

201 - Clearing and Grubbing

201.01_nat_us_02_18_2005

201.01 Description

Replace with the following

This work consists of clearing and grubbing within clearing limits and other designated areas.

201.04_nat_us_02_18_2005

201.04 Clearing.

Add the following:

When marked in advance, remove dead trees over 6 inches in diameter measured at 12 inches above the ground that lean toward the road and are tall enough to reach the roadbed.

201.04_nat_us_02_22_2005

201.04 Clearing. (c)

Delete paragraph (c) and replace with the following:

(c) In areas outside the excavation, embankment, and slope rounding limits, cut stumps to within 12 inches or one-third of the stump diameter of the ground, whichever is higher, measured on the side adjacent to the highest ground. For timber sales, stump heights will meet the requirements of the Timber Sale contract.

201.04 Clearing.

Delete subsection (d) and replace with the following:

(d) Do not cut vegetation less than 3 feet tall and less than 3 inches in diameter, that is within the clearing limits but beyond the roadway and not in a decking area, and that does not interfere with sight distance along the road.

Add the following:

(e) Trim branches of remaining trees or shrubs to give a clear height of 14 feet above the roadbed unless otherwise indicated. Trim tree limbs as near flush with the trunk as practicable.

(f) Remove brush from log decks. Deck logs so that logs are piled parallel to one another; can be removed by standard log loading equipment; will not damage standing

trees; will not interfere with drainage, and will not roll. Keep logs in log decks free of brush and soil.

203 - Removal of Structures and Obstructions

203.01_nat_us_02_25_2005

203.01 Description.

Delete and replace with the following:

This work consists of disposing of construction slash and debris, salvaging, removing, and disposing of buildings, fences, structures, pavements, culverts, utilities, curbs, sidewalks, and other obstructions.

203.04_nat_us_02_18_2005

203.04 Removing Material.

Replace the fourth and fifth paragraphs with the following:

Where part of an existing culvert is removed, remove the entire culvert upstream from the removal. The remaining downstream culvert may be left in place if no portion of the culvert is within 12 inches of the subgrade, embankment slope, or new culvert or structure; and the culvert ends are sealed with concrete.

Remove structures and obstructions in the roadbed to 12 inches below subgrade elevation. Remove structures and obstructions outside the roadbed to 12 inches below finished ground or to the natural stream bottom.

203.05_nat_us_02_18_2005

203.05 Disposing of Material.

Add the following:

(e) Windrowing Construction Slash. Place construction slash outside the roadway in neat, compacted windrows approximately parallel to and along the toeline of embankment slopes. Do not permit the top of the windrows to extend above subgrade. Use construction equipment to matt down all material in a windrow to form a compact and uniform pile. Construct breaks of at least 15 feet at least every 200 feet in a windrow. Do not place windrows against trees. Obtain approval for pioneer roads. A pioneer road may be constructed to provide an area for placement of windrows, provided the excavated material is kept within the clearing limits and does not adversely affect the road construction.

(f) Scattering. Scatter construction slash outside the clearing limits and 10' beyond the edge of road without damaging trees. Limb all logs. Place logs and stumps away from trees, positioned so they will not roll, and are not on top of one another. Limb and scatter other construction slash to reduce slash concentrations.

(g) Chipping or Grinding. Use an approved chipping machine to grind slash and stumps greater than 3 inches in diameter and longer than 3 feet. Deposit chips or ground woody material on embankment slopes or outside the roadway to a loose depth less than 6 inches. Minor amounts of

chips or ground woody material may be permitted within the roadway if they are thoroughly mixed with soil and do not form a layer.

(h) Debris Mat. Use tree limbs, tops, cull logs, split stumps, wood chunks, and other debris to form a mat upon which construction equipment is operated. Place stumps upside down and blend stumps into the mat.

(i) Decking Firewood Material. Remove brush from decks. Limb and deck logs that do not meet Utilization Standards according to Subsection 201.04 as directed by the CO. Cut logs to lengths less than 30 feet. Ensure that logs stacks are stable and free of brush and soil.

(j) Removal to designated locations. Remove construction slash to designated locations.

(k) Piling. Pile construction slash in designated areas. Place and construct piles so that if the piles are burned, the burning will not damage remaining trees. Keep piles free of dirt from stumps. Cut unmerchantable logs into lengths of less than 20 feet.

(l) Placing Slash on Embankment Slopes. Place construction slash on completed embankment slopes to reduce soil erosion. Place construction slash as flat as practicable on the completed slope. Do not place slash closer than 2 feet below subgrade. Priority for use of available slash is for: (1) through fills; (2) insides of curves; and (3) ditch relief outlets.

(m) Hydrological Sensitive Placement. Where required use this method in combination with other designated methods to dispose of material to reduce erosion and to aid in re-vegetation:

1. Place windrow segments on contours, wrap in type I geotextile.
2. Place logs as log erosion barriers on contours. Place logs so that 80% of their length is on the ground surface.
3. Scatter slash on bare or disturbed areas within or outside the clearing limits as directed.
4. Scatter chips or ground woody material on bare or disturbed areas within or outside the clearing limits as directed.

Place stumps in swales or on sites to form planting pockets. Place windrow segments on contours, wrap in type I geotextile.

203.08_nat_us_02_24_2005

203.08 Payment

Add the following:

Disposal of construction slash will be compensated under the designated pay item in Section 201.

204 - Excavation and Embankment

204.00_nat_us_03_26_2009

Replace Section 204 in its entirety with the following:

Description

204.01 This work consists of excavating material and constructing embankments. This includes furnishing, hauling, stockpiling, placing, disposing, sloping, shaping, compacting, and finishing earthen and rocky material.

204.02 Definitions.

(a) Excavation. Excavation consists of the following:

(1) Roadway excavation. All material excavated from within the right-of-way or easement areas, except subexcavation covered in (2) below and structure excavation covered in Sections 208 and 209. Roadway excavation includes all material encountered regardless of its nature or characteristics.

(2) Subexcavation. Material excavated from below subgrade elevation in cut sections or from below the original groundline in embankment sections. Subexcavation does not include the work required by Subsections 204.05, 204.06(b), and 204.06(c).

(3) Borrow excavation. Material used for embankment construction that is obtained from outside the roadway prism. Borrow excavation includes unclassified borrow, select borrow, and select topping.

(b) Embankment construction. Embankment construction consists of placing and compacting roadway or borrow excavation. This work includes:

(1) Preparing foundation for embankment;
(2) Constructing roadway embankments;
(3) Benching for side-hill embankments;
(4) Constructing dikes, ramps, mounds, and berms; and
(5) Backfilling subexcavated areas, holes, pits, and other depressions.

(c) Conserved topsoil. Excavated material conserved from the roadway excavation and embankment foundation areas that is suitable for growth of grass, cover crops, or native vegetation.

(d) Waste. Excess and unsuitable roadway excavation and subexcavation that cannot be used.

Material

204.03 Conform to the following Subsections:

Backfill material	704.03
Select borrow	704.07
Select topping	704.08
Topping	704.05
Unclassified borrow	704.06
Water	725.01

Construction Requirements

204.04 Preparation for Roadway Excavation and Embankment Construction. Clear the area of vegetation and obstructions according to Sections 201 and 203.

204.05 Reserved.

204.06 Roadway Excavation. Excavate as follows:

(a) General. Do not disturb material and vegetation outside the construction limits. Incorporate only suitable material into embankments. Replace any shortage of suitable material caused by premature disposal of roadway excavation. Dispose of unsuitable or excess excavation material according to Subsection 204.14.

At the end of each day's operations, shape to drain and compact the work area to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

Retrieve material deposited outside of the clearing limits as directed by the CO. Place unsuitable material in designated areas.

(b) Rock cuts. Blast rock according to Section 205. Excavate rock cuts to 6 inches below subgrade within the roadbed limits. Backfill to subgrade with topping or with other suitable material. Compact the material according to Subsection 204.11

(c) Earth cuts. Scarify earth cuts to 6 inches below subgrade within the roadbed limits. Compact the scarified material according to Subsection 204.11.

(d) Pioneer Roads. Road pioneering, slash disposal, and grubbing of stumps may proceed concurrently with excavation. Conduct excavation and placement operations so material to be treated under Section 201 will not be incorporated into the roadway unless specified in the slash treatment method. Maintain drainage during pioneering operations.

Remove snow and ice in advance of the work and deposit beyond the roadway limits in a manner that will not waste material or generate sediment. Do not incorporate snow and ice into embankments. Place snow or ice in a manner to prevent resource damage.

204.07 Subexcavation. Excavate material to the limits designated by the CO. Take cross-sections according to Section 152. Prevent unsuitable material from becoming mixed with the backfill. Dispose of unsuitable material according to Subsection 204.14. Backfill the subexcavation with topping, or other suitable material. Compact the material according to Subsection 204.11.

204.08 Borrow Excavation. Use all suitable roadway excavation in embankment construction. Do not use borrow excavation when it results in excess roadway excavation. Deduct excess borrow excavation from the appropriate borrow excavation quantity.

Obtain borrow source acceptance according to Subsection 105.02. Develop and restore borrow sources according to Subsection 105.03. Do not excavate beyond the established limits. When applicable, shape the borrow source to permit accurate measurements when excavation is complete.

204.09 Preparing Foundation for Embankment Construction. Prepare foundation for embankment construction as follows:

(a) Embankment less than 4 feet high over natural ground. When designated, remove topsoil and break up the ground surface to a minimum depth of 6 inches by plowing or scarifying. Compact the ground surface according to Subsection 204.11.

(b) Embankments over an existing asphalt, concrete, or gravel road surface. Scarify gravel roads to a minimum depth of 6 inches. Scarify or pulverize asphalt and concrete roads to 6 inches below the pavement. Reduce all particles to a maximum size of 6 inches and produce a uniform material. Compact the surface according to Subsection 204.11.

(c) Embankment across ground not capable of supporting equipment. Dump successive loads of embankment material in a uniformly distributed layer to construct the lower portion of the embankment. Limit the layer thickness to the minimum depth necessary to support the equipment.

(d) Embankment on an existing slope steeper than 1V:3H. Cut horizontal benches in the existing slope to a sufficient width to accommodate placement and compaction operations and equipment. Bench the slope as the embankment is placed and compacted in layers. Begin each bench at the intersection of the original ground and the vertical cut of the previous bench.

204.10 Embankment Construction. Incorporate only suitable roadway excavation material into the embankment. When the supply of suitable roadway excavation is exhausted, furnish unclassified borrow to complete the embankment. Obtain written approval before beginning construction of embankments over 6 feet high at subgrade centerline. Construct embankments as follows:

(a) General. At the end of each day's operations, shape to drain and compact the embankment surface to a uniform cross-section. Eliminate all ruts and low spots that could hold water.

During all stages of construction, route and distribute hauling and leveling equipment over the width and length of each layer of material.

Compact embankment side slopes flatter than 1V:1.75H with a tamping type roller or by walking with a dozer. For slopes 1V:1.75H or steeper, compact the slopes as construction of the embankment progresses.

Where placing embankment on one side of abutments, wing walls, piers, or culvert headwalls, compact the material using methods that prevent excessive pressure against the structure.

Where placing embankment material on both sides of a concrete wall or box structure, conduct operations so compacted embankment material is at the same elevation on both sides of the structure.

Where structural pilings are placed in embankment locations, limit the maximum particle size to 4 inches.

(b) Embankment within the roadway prism. Place embankment material in horizontal layers not exceeding 12 inches in compacted thickness. Incorporate oversize boulders or rock fragments into the 12-inch layers by reducing them in size or placing them individually as required by (c) below. Compact each layer according to Subsection 204.11 before placing the next layer.

Material composed predominately of boulders or rock fragments too large for 12-inch layers may be placed in layers up to 24 inches thick. Incorporate oversize boulders or rock fragments into the 24-inch layer by reducing them in size or placing them individually according to (c) below. Place sufficient earth and smaller rocks to fill the voids. Compact each layer according to Subsection 204.11 before placing the next layer.

(c) Individual rock fragments and boulders. Place individual rock fragments and boulders greater than 24 inches in diameter as follows:

(1) Reduce rock to less than 48 inches in the largest dimension.

(2) Distribute rock within the embankment to prevent nesting.

(3) Place layers of embankment material around each rock to a depth not greater than that permitted by (b) above. Fill all the voids between rocks.

(4) Compact each layer according to Subsection 204.11 before placing the next layer.

(d) Embankment outside of roadway prism. Where placing embankment outside the staked roadway prism, place material in horizontal layers not exceeding 24 inches in compacted thickness. Compact each layer according to Subsection 204.11.

204.11 Compaction. Compact the embankment using one of the following methods as specified:

(a) **Compaction A.** Use AASHTO T 27 to determine the amount of material retained on a Number 4 sieve. If there is more than 80 percent retained on the No. 4 sieve use procedure (1).

If there is 50 to 80 percent retained on the No. 4 sieve use procedure (2). If there is less than 50 percent retained on the No. 4 sieve use procedure (3).

(1) Adjust the moisture content to a level suitable for compaction. Fill the interstices around rock with earth or other fine material as practical. Use compression-type rollers at speeds less than 6feet per second and vibratory rollers at speeds less than 3 feet per second. Compact each layer of material full width with one of the following and until there is no visible evidence of further consolidation.

(a) Four roller passes of a vibratory roller having a minimum dynamic force of 40,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.

(b) Eight roller passes of a 20-ton compression-type roller.

(c) Eight roller passes of a vibratory roller having a minimum dynamic force of 30,000 pounds impact per vibration and a minimum frequency of 1000 vibrations per minute.

Increase the compactive effort for layers deeper than 12 inches as follows:

- For each additional 6 inches or fraction thereof, increase the number of roller passes in (a) above by four passes.
- For each additional 6 inches or fraction thereof, increase the number of roller passes in (b) and (c) above, by eight passes.

(2) Use AASHTO T 99 to determine the optimum moisture content of the portion of the material passing a No. 4 sieve. Multiply this number by the percentage of material passing a No. 4 sieve, and add 2 percent to determine the optimum moisture content of the material. Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content.

Use compression-type rollers at speeds less than 6 feet per second and vibratory rollers at speeds less than 3 feet per second. Compact each layer of material full width according to (1) above.

(3) Classify the material according to AASHTO M 145. For material classified A-1 or A-2-4, determine the maximum density according to AASHTO T 180, method D. For other material classifications, determine the optimum moisture content and maximum density according to AASHTO T 99, method C.

Adjust the moisture content of material classified A-1 through A-5 to a moisture content suitable for compaction. Adjust the moisture content of material classified A-6 and A-7 to within 2 percent of the optimum moisture content.

Use compression-type or vibratory rollers. Compact each layer of material full width to at least 95 percent of the maximum density. Determine the in-place density and moisture content according to AASHTO T 310 or other approved test procedures. When required, use AASHTO T 224 to correct for coarse particles.

(b) Compaction B. Place material by end dumping to the minimum depth needed for operation of spreading equipment. Adjust the moisture content of the material to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Operate compaction equipment over the full width of each layer until there is no visible evidence of further consolidation or, if when a sheepsfoot roller is used, the roller "walks out" of the layer. Make at least three complete passes.

(c) Compaction C. Place material by end dumping to the minimum depth needed for operation of spreading equipment. Level and smooth each embankment layer before placing the next layers. Operate hauling and spreading equipment uniformly over the full width of each layer. Construct a solid embankment with adequate compaction by working smaller rock and fines in with the larger rocks to fill the voids, and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.

204.12 Ditches. Slope, grade, and shape ditches. Remove all projecting roots, stumps, rock, or similar matter. Maintain all ditches in an open condition and free from leaves, sticks, and other debris.

Form furrow ditches by plowing or using other acceptable methods to produce a continuous furrow. Place all excavated material on the downhill side so the bottom of the ditch is approximately 18 inches below the crest of the loose material. Clean the ditch using a hand shovel, ditcher, or other suitable method. Shape to provide drainage without overflow.

204.13 Sloping, Shaping, and Finishing. Complete slopes, ditches, culverts, riprap, and other underground minor structures before placing aggregate courses. Slope, shape, and finish as follows:

(a) Sloping. Leave all earth slopes with uniform roughened surfaces, except as described in (b) below, with no noticeable break as viewed from the road. Except in solid rock, round tops and bottoms of all slopes including the slopes of drainage ditches. Round material overlaying solid rock to the extent practical. Scale all rock slopes. Slope rounding is not required on tolerance class D though M roads.

If a slide or slipout occurs on a cut or embankment slope, remove or replace the material, and repair or restore all damage to the work. Bench or key the slope to stabilize the slide. Reshape the cut or embankment slope to an acceptable condition.

(b) Stepped slopes. Where required by the contract, construct steps on slopes of 1⅓V:1H to 1V:2H. Construct the steps approximately 18 inches high. Blend the steps into natural ground at the end of the cut. If the slope contains nonrippable rock outcrops, blend steps into the rock. Remove loose material found in transitional area. Except for removing large rocks that may fall, scaling stepped slopes is not required.

(c) Shaping. Shape the subgrade to a smooth surface and to the cross-section required. Shape slopes to gradually transition into slope adjustments without noticeable breaks. At the ends of

cuts and at intersections of cuts and embankments, adjust slopes in the horizontal and vertical planes to blend into each other or into the natural ground.

(d) Finishing. Finish the roadbed to be smooth and uniform, and shaped to conform to the typical sections. Remove unsuitable material from the roadbed and replace it with suitable material. Finish roadbeds to the tolerance class shown in table 204-2.Ensure that the subgrade is visibly moist during shaping and dressing. Scarify to 6 inches below the bottom of low sections, holes, cracks, or depressions and bring back to grade with suitable material. Maintain proper ditch drainage.

For surfaced roads, remove all material larger than 6 inches from the top 6 inches of the roadbed.

For unsurfaced roads, use one of the following methods to finish the roadbed:

(1) **Method A**. Remove all material larger than 6 inches from the top 6 inches of the roadbed and replace with suitable material.
(2) **Method B**. Use a vibratory grid roller or approved equal with a minimum weight of 10 tons. Roll at least 5 full-width passes or until there is no visible evidence of further consolidation.
(3) **Method C**. For roads designated as Construction Tolerance Class K, L, or M, finish the roadbed by spreading the excavation. Eliminate rock berms.

204.14 Disposal of Unsuitable or Excess Material. Dispose of unsuitable or excess material at designated sites or legally off of the project.

When there is a pay item for waste, shape and compact the waste material in its final location. Do not mix clearing or other material not subject to payment with the waste material.

204.15 Acceptance. See Table 204-1 for sampling and testing requirements.

Material for embankment and conserved topsoil will be evaluated under Subsections 106.02 and 106.04.

Excavation and embankment construction will be evaluated under Subsections 106.02 and 106.04.

Clearing and removal of obstructions will be evaluated under Sections 201 and 203.

Measurement

204.16 Measure the Section 204 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

(a) Roadway excavation. Measure roadway excavation in its original position as follows:

(1) Include the following volumes in roadway excavation:

(a) Roadway prism excavation;
(b) Rock material excavated and removed from below subgrade in cut sections;
(c) Unsuitable material below subgrade and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;
(d) Ditches, except furrow ditches measured under a separate bid item;
*(e*Topsoil;
(f) Borrow material used in the work when a pay item for borrow is not shown in the bid schedule;
(g) Loose scattered rocks removed and placed as required within the roadway;
(h) Conserved material taken from stockpiles and used in Section 204 work; and
(i) Slide and slipout material not attributable to the Contractor's method of operation.

(2) Do not include the following in roadway excavation:
(a) Overburden and other spoil material from borrow sources;
(b) Overbreakage from the backslope in rock excavation;
(c) Water or other liquid material;
(d) Material used for purposes other than required;
(e) Roadbed material scarified in place and not removed;
(f) Material excavated when stepping cut slopes;
(g) Material excavated when rounding cut slopes;
(h) Preparing foundations for embankment construction;
(i) Material excavated when benching for embankments;
(j) Slide or slipout material attributable to the Contractor's method of operation;
(k) Conserved material taken from stockpiles constructed at the option of the Contractor; and
(l) Material excavated outside the established slope limits.

(3) When both roadway excavation and embankment construction pay items are shown in the bid schedule, measure the following as roadway excavation only:
(a) Unsuitable material below subgrade in cuts and unsuitable material beneath embankment areas when a pay item for subexcavation is not shown in the bid schedule;
(b) Slide and slipout material not attributable to the Contractor's method of operations; and
(c) Drainage ditches, channel changes, and diversion ditches.

(b) Unclassified borrow, select borrow, and select topping. When measuring by the cubic yard measure in its original position. If borrow excavation is measured by the cubic yard in place, take initial cross-sections of the ground surface after stripping overburden. Upon completion of excavation and after the borrow source waste material is returned to the source, retake cross-sections before replacing the overburden.
Do not measure borrow excavation used in place of excess roadway excavation.

(c) Embankment construction. Measure embankment construction in its final position. Do not make deductions from the embankment construction quantity for the volume of minor structures.

(1) Include the following volumes in embankment construction:
(a) Roadway embankments;
(b) Material used to backfill subexcavated areas, holes, pits, and other depressions;
(c) Material used to restore obliterated roadbeds to original contours; and
(d) Material used for dikes, ramps, mounds, and berms.

(2) Do not include the following in embankment construction:
(a) Preparing foundations for embankment construction;
(b) Adjustments for subsidence or settlement of the embankment or of the foundation on which the embankment is placed; and
(c) Material used to round fill slopes.

(d) Rounding cut slopes. Measure rounding cut slopes horizontally along the centerline of the roadway if a pay item for slope rounding is included in the bid schedule. If a pay item for slope rounding is not included in the bid schedule slope rounding will be considered subsidiary to excavation.

(e) Waste. Measure waste by the cubic yard in its final position. Take initial cross-sections of the ground surface after stripping over burden. Upon completion of the waste placement, retake cross-sections before replacing overburden.

(f) Slope scaling. Measure slope scaling by the cubic yard in the hauling vehicle.

Payment

204.17 The accepted quantities will be paid at the contract price per unit of measurement for the Section 204 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 204-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Topping (704.05) & unclassified borrow (704.06)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type	Processed material before incorporating in work	Yes, when requested	Before using in work
		Moisture-density	—	AASHTO T 180, method D[(1)] or T 99, method C[(1)]	1 per soil type but not less than 1 per	"	"	"
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd^2 but not less than 1 per layer	In-place	—	Before placing next layer
Select borrow (704.07 & Select topping (704.08)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type but not less than 1 for each day of production	Processed material before incorporating	Yes, when requested	Before using in work
		Gradation	—	AASHTO T 27	"	"	"	"
		Liquid limit	—	AASHTO T 89	"	"	"	"
		Moisture-density	—	AASHTO T 180, method D[(1)] or T 99, method C[(1)]	1 per soil type but not less than 1 per	"	"	"
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 6000 yd^2 but not less than 1 per layer	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor

Table 204-1 (continued)
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Earth embankment (204.11, Compaction A)	Measured and tested for conformance (106.04)	Classification	—	AASHTO M 145	1 per soil type	Source of Material	Yes, when requested	Before using in work
		Moisture-density	—	AASHTO T 180, method D[(1)] or T 99, method C[(1)]	1 per soil type but not less than 1 per 13,000 yd^3	"	"	"
		Compaction	—	AASHTO T 310 or other approved procedures	1 per 3500 yd^2 but not less than 1 per layer	In-place	—	Before placing next layer
Top of subgrade (204.11 Compaction A)	Measured and tested for conformance (106.04)	Compaction	—	AASHTO T 310 or other approved procedures	1 per 2500 yd^2	In-place	—	Before placing next layer

(1) Minimum of 5 points per proctor.

Table 204-2
Construction Tolerances

	Tolerance Class [a]												
	A	B	C	D	E	F	G	H	I	J	K	L	M
Roadbed width (ft)	+0.5	+0.5	+1.0	+1.0	+1.0	+1.0	+1.5	+1.0	+2.0	+2.0	+2.0	+2.0	+2.0
Subgrade elevation (ft)	±0.1	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±2.0	±3.0	±2.0	±3.0	(c)
Centerline alignment (ft)	±0.2	±0.2	±0.5	±0.5	±1.0	±1.0	±1.5	±1.5	±2.0	±3.0	±3.0	±5.0	(c)
Slopes, excavation, and embankment (% slope[b])	±3	±5	±5	±5	±5	±5	±10	±10	±10	±10	±20	±20	±20

(a) Maximum allowable deviation from construction stakes and drawings.
(b) Maximum allowable deviation from staked slope measured from slope stakes or hinge points.
(c) Unless otherwise shown the centerline alignment and subgrade elevation, as built, have no horizontal curves with a radius of less than 80 feet, and no vertical curves with a curve length of less than 80 feet when the algebraic difference in the grade change is less than 10 percent, or a curve length of less than 100 feet when the algebraic difference of the grade change is greater than or equal to 10 percent. The centerline grade is not to exceed 20 percent in 100 feet of length.

209 - Structure Excavation and Backfill

209.10_nat_us_10_23_2007

209.10 Backfill.

(a) General.

Add the following:

Replace any pipe that is distorted by more than 5 percent of nominal dimensions, or that is ruptured or broken.

Do not place or backfill pipe that meets any of the following conditions until the excavation and foundation have been approved in writing by the CO:

- Embankment height greater than 6 feet at subgrade centerline.
- Installation in a protected streamcourse.
- Round pipe with a diameter of 48 inches or greater.
- Pipe arches with a span of 50 inches or greater.
- Any box culvert of structure other than pipe culverts.

(b) Pipe culverts.

(1) Pipe culverts with compacted backfill.

Add the following:

Excavate a minimum of 1' on each side of the pipe or as needed to effectively achieve compaction requirements. Backfill without damaging or displacing the pipe. Complete backfilling of the trench with suitable material.

209.11_nat_us_02_24_2005

209.11 Compacting.

Delete the subsection and add the following:

Compact backfill using designated compaction method A, B, or C:

Method A. Ensure that backfill density exceeds the density of the surrounding embankment.

Method B. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact each layer using appropriate compaction equipment until visual displacement ceases. For compaction under sections 252, 254, 255, 257, 258 and 262 compact with a vibratory steel wheeled roller with a mass of at least 8 tons.

Method C. Determine optimum moisture content and maximum density according to AASHTO T 99 method C. Adjust the moisture content of the backfill material to a moisture content suitable for compaction. Compact material placed in all layers to at least 95 percent of the maximum density. Determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

Table 209-1 Sampling and Testing Requirements
Add the following:

(2) Compaction methods (A) and (B) do not require AASHTO T-99 or T-310 test methods for foundation fill.

230 - Roadside Brushing

230.00_01_us_10_11_2006

Description

230.01 Work. This work consists of removing all vegetative material including limbs, residual slash, live roadside brush, and trees within the brushing limits designated on the plans. Brushing areas include turnouts. If rocks or other obstructions are encountered, they shall be removed before brushing can be completed.

Construction

230.02 Brushing. Cut all brush and trees (6 inches diameter, or less, at the point of cut) inside the brushing limits and outside the roadbed no higher than 4 inches above ground level (6 inches for machine brushing). Limb live trees with a diameter larger than 6 inches to provide a clear height of 14 feet above the road surface.

Cut all brush and trees located on the roadbed as nearly flush to the road surface as possible so stumps will not become a hazard to vehicle tires.

230.03 Windfalls. Limb windfalls lying within or across the brushing limits, cut off at the top of the existing cut slope or 6 feet from road edge and 6 feet from the shoulder on the fill slope. Dispose of windfall material as slash.

230.04 Road Junctions. Do not deposit brushing debris on the roadway of adjoining roads.

230.05 Slash Treatment. Scatter slash outside the brushing limits without damaging residual trees. Slash is defined as any material that has a length greater than 18 inches or a diameter greater than 1 inch at any point. Do not deposit material in streams, streambeds, culvert inlets or outlets, drainage ways, cattle guards, or within timber sale unit boundaries.

230.06 Acceptance. Roadside brushing will be evaluated under Subsection 106.02.

Measurement

230.07 Method. Measure the Section 230 items listed in the bid schedule according to Subsection 109.02 and the following.

Linear measurements will be horizontal along the road centerline.

Quantities will be the number of miles (or stations) and fractions thereof along the road centerline.

Payment

230.08. The accepted quantities will be paid at the contract price per unit of measurement for the section 230 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this section. See Subsection 109.05.

251 - Riprap

251.03_nat_us_08_05_2009

Construction Requirements

251.03 General.

Add the following:

Place riprap under or adjacent to drainage structures before placing the drainage structure unless otherwise approved by the CO.

251.08 Measurement.

Add the following:

Payment for excavation and embankment required for placement of riprap is indirectly included in the pay item for riprap.

303 - Road Reconditioning

303.00_0605_us_05_11_2007

Delete Section 303 in its entirety and replace with the following.

Description

303.01 This work consists of reconditioning ditches, shoulders, roadbeds, parking areas, approach road intersections, cattleguards, asphalt surfaces and aggregate surfaces. Clean and maintain all drainage structures.

Material

303.02 Conform to the following Subsection:

Water 725.01

Construction Requirements

303.03 Ditch Reconditioning. Remove all slide material, sediment, vegetation, and other debris from the existing ditches and culvert inlets and outlets. Reshape ditches and culvert inlets and outlets to achieve positive drainage and a uniform ditch width, depth, and grade. Dispose of waste as shown on the plans.

303.04 Shoulder Reconditioning. Repair soft and unstable areas according to Subsection 204.07. Remove all slide material, vegetation, and other debris from existing shoulders including shoulders of parking areas, turnouts, and other widened areas. Dispose of waste as shown on the plans.

303.05 Roadbed Reconditioning Repair soft and unstable areas according to Subsection 204.07. Remove all organic, deleterious material larger than 6 inches from the top 6 inches of subgrade. Dispose of waste as shown on the plans. Scarify and shape the traveled way and shoulders at locations and to the depth and width designated on the plans. Remove surface irregularities and shape to provide a uniform surface.

Dispose of rock larger than 4 inches brought to the surface during scarification in areas designated on the plans.

For portions of roads not requiring scarification, the roadbed may contain rocks larger than 4 inches provided they do not extend above the finished roadbed surface. Reduce in place or

remove rock extending above the finished roadbed surface. Dispose of removed rock in areas designated on the plans.

Compact using the following method as specified:

(a) Layer Placement Method (Hauling and Spreading Equipment). Place material by end dumping to the minimum depth needed for operation of spreading equipment. Level and smooth each embankment layer before placing the next layers. Operate hauling and spreading equipment uniformly over the full width of each layer. Construct a solid embankment with adequate compaction by working smaller rock and fines in with the larger rocks to fill the voids, and by operating hauling and spreading equipment uniformly over the full width of each layer as the embankment is constructed.

(b) Layer Placement (Roller Compaction) Method. Place material by end dumping to the minimum depth needed for operation of spreading equipment. Adjust the moisture content of the material to obtain a mass that will not visibly deflect under the load of the hauling and spreading equipment. Operate compaction equipment over the full width of each layer until visible deformation of the layer ceases or, in when a sheepsfoot roller is used, the roller "walks out" of the layer. Make at least three complete passes. . Use rollers that meet the following requirements:

(1) Steel wheeled rollers, other than vibratory, capable of exerting a force of not less than 250 pounds per inch of width of the compression roll or rolls.

(2) Vibratory steel wheeled rollers equipped with amplitude and frequency controls with a minimum weight of 6 tons, specifically designed to compact the material on which it is used.

(3) Pneumatic-tired rollers with smooth tread tires of equal size that will provide a uniform compacting pressure for the full width of the roller and capable of exerting a ground pressure of at least 80 psi.

303.06 Aggregate Surface Reconditioning. Repair soft and unstable areas to the full depth of the aggregate surface and according to Subsection 204.07. Scarify to the depth and width shown on the plans, and remove surface irregularities. Reshape, finish, and compact the entire aggregate surface according to Section 301, Section 308, Section 321, or Section 322 as applicable.

303.07 Roadway Reconditioning. Perform all the applicable work described in Subsections 303.03 through 303.06.

Maintain the existing cross slope or crown unless otherwise shown on the plans. Establish a blading pattern that will retain the surfacing on the roadbed and provide a through mixing of the materials within the completed surface width.

Blade and shape the subgrade for both surfaced and unsurfaced roads when moisture content is suitable for compaction.

303.08 Pulverizing. Scarify the surface to the designated depth and width. Pulverize all material to a size one and one half times the maximum sized aggregate or to 1½ inches, whichever is greater. Mix, spread, compact, and finish the material according to Section 322.

303.09 Acceptance. Road reconditioning work will be evaluated under Subsections 106.02 and 106.04.

Measurement

303.10 Measure the Section 303 items listed in the Schedule of Items according to Subsection 109.02 and the following as applicable.

Measure ditch reconditioning and shoulder reconditioning by the mile, by the station or foot horizontally along the centerline of the roadway for each side of the roadway.

Measure roadbed reconditioning, aggregate surface reconditioning, roadway reconditioning, and pulverizing by the mile, by the station, or by the square yard.

Payment

303.11 The accepted quantities will be paid at the contract price per unit of measurement for the Section 303 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

322 - Minor Aggregate Courses

322.00_nat_us_10_14_2011

Description

322.01 This work consists of constructing one or more courses of aggregate on a prepared surface. Work includes producing aggregate by grid rolling, screening, or crushing methods, or placing pit-run or Government-furnished aggregate.

Surface aggregate grading is designated as shown in Table 703-3.

Subbase and base aggregate grading is designated as shown in Table 703-2.

Screened aggregate grading is designated as shown in Table 703-16.

Material

322.02 Conform to the following Subsections:

Aggregate	703.05
Water	725.01

Construction Requirements

322.03 General. Prepare the surface on which the aggregate course is placed according to Section 204 or 303 as applicable.

Request approval of the roadbed in writing before placing aggregate.

Develop, haul, and apply water in accordance to Section 170.

Submit target values within the gradation ranges shown in Table 703-2 or 703-3 for the required grading. After reviewing the proposed target values the CO will determine the final values for the gradation and notify the Contractor in writing.

No quality requirements or gradation other than maximum size will be required for pit run and grid-rolled material. For grid rolling, use all suitable material that can be reduced to maximum size.

After processing on the road, remove all oversize material from the road and dispose of it as directed by the CO.

If the aggregate is produced and stockpiled before placement, handle and stockpiled according to Section 320. Establish stockpile sites at approved locations.

322.04 Mixing and Spreading. Mix the aggregate and adjust the moisture content to obtain a uniform mixture with a moisture content suitable for the specified compaction method. Spread and shape the mixture on the prepared surface in a uniform layer with no segregation of size, and to a loose depth that will provide the required compacted thickness.

Do not place in layers exceeding 6 inches in compacted thickness for aggregate base and surface courses or twice the maximum particle size for screened aggregate. When more than one layer is necessary, compact each layer according to Subsection 322.05 before placing the next layer. Route hauling and leveling equipment uniformly over the full width.

When placing aggregate over geotextile, place aggregate in a single lift to the full depth specified.

322.05 Compacting. Compact each layer full width. Roll from the sides to the center, parallel to the centerline of the road. Along curbs, headers, walls, and all places not accessible to the roller, compact the material with approved tampers or compactors.

Compact the aggregate using one of the following methods as specified:

Compaction A. Operating spreading and hauling equipment over the full width of the travelway.

Compaction B. Operate rollers and compact as specified in Subsection 204.11(a)(1).

Compaction C. Moisten or dry the aggregate to a uniform moisture content between 5 and 7 percent based on total dry weight of the mixture. Operate rollers and compact as specified in Subsection 204.11(a)(1).

Compaction D. Compact to a density of at least 95 percent of the maximum density, as determined by AASHTO T 99, method C or D.

Compaction E. Removed.

Compaction F. Compact to a density of at least 95 per-cent of the maximum density, as determined by AASHTO T 180, method C or D.

Compaction G. Removed.

For all compaction methods, blade the surface of each layer during the compaction operations to remove irregularities and produce a smooth, even surface. When a density requirement is specified, determine the in place density and moisture content according to AASHTO T 310 or other approved test procedures.

322.06 Construction Tolerance. If grade finishing stakes are required, finish the surface to within ±0.10 feet from staked line and grade elevation.

If grade finishing stakes are not required, shape the surface to the required template and check the surface with a 10-foot straightedge. Defective areas are surface deviations in excess of 1/2 inch in 10 feet between any two contacts of the straightedge with the surface.

Correct all defective areas by loosening the material, adding or removing material, reshaping, and compacting.

Ensure that the compacted thickness is not consistently above or below the specified thickness. The maximum variation from the compacted specified thickness is ½ inch.

Ensure that the compacted width is not consistently above the specified width. The maximum variation from the specified width will not exceed +12 inches at any point.

322.07 Maintenance. Maintain the aggregate course to the correct line, grade, and cross-section by blading, watering, rolling, or any combination thereof until placement of the next course. Correct all defects according to Subsection 322.06.

322.08 Acceptance. See Table 322-1 or Table 322-2 as applicable, for sampling and testing requirements.

Aggregate gradation and surface course plasticity index will be evaluated under Subsection 106.04. If the aggregate is obtained from a Government stockpile then the above characteristics will be evaluated under Subsection 106.02. Other aggregate quality properties will be evaluated under Subsections 106.02 and 106.04. Placement of aggregate courses will be evaluated under Subsections 106.02 and 106.04.

The allowable upper and lower aggregate gradation limits are the Target Value plus or minus the allowable deviations shown in Tables 703-2 and 703-3.

The allowable upper and lower Plasticity index limits for surface courses are stated in 703.05(b).

Preparation of the surface on which the aggregate course is placed will be evaluated under Section 204 or 303 as applicable.

Measurement

322.09 Measure the Section 322 items listed in the bid schedule according to Subsection 109.02 and the following as applicable.

Measure square yard width horizontally to include the top of aggregate width including designed widening. Measure the square yard length horizontally along the centerline of the roadway.

If the measurement for aggregate is by cubic yard using contract quantities then measure aggregate by the cubic yard in-place once compacted, otherwise measurement for aggregate by the cubic yard is measured by the cubic yard in the hauling vehicle.

Measure thickness perpendicular to the grade of the travelway.

Measure width perpendicular to the centerline.

Payment

322.10 The accepted quantities will be paid at the contract price per unit of measurement for the Section 322 pay items listed in the bid schedule. Payment will be full compensation for the work prescribed in this Section. See Subsection 109.05.

Table 322-1
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Aggregate source quality 703.05	Measured and tested for conformance (106.04 & 105)	LA abrasion (coarse)	—	AASHTO T 96	1 per type & source of material	Source of material	Yes, when requested	Before using in work
		Sodium sulfate soundness loss (coarse & fine)	—	AASHTO T 104	"	"	"	"
		Durability index (coarse & fine)	—	AASHTO T 210	"	"	"	"
		Fractured faces	—	ASTM D 5821	"	"	"	"
Subbase, Base, and Surface courses	Measured and tested for conformance (106.04)	Sample	—	AASHTO T 2	2 per day	From windrow or roadbed after processing or from approved crusher sampling device	Yes	48 hours

Table 322-1 (continued)
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Subbase, Base, and Surface	Measured and tested for conformance (106.04)	Moisture-density Method D	—	AASHTO T 99 [1]	1 per type and source of material	Source of material	Yes, when requested	Before using in work
			—		"	"	"	"
		Moisture-density Method F	—	AASHTO T 180[1]	"	"	"	"
			—		"	"	"	"
		In-place density & moisture content	—	AASHTO T 310 or other approved procedures	3 per day	In-place	—	Before placing next layer

Table 322-2
Sampling and Testing Requirements

Material or Product	Type of Acceptance (Subsection)	Characteristic	Category	Test Methods Specifications	Sampling Frequency	Point of Sampling	Split Sample	Reporting Time
Screened Aggregate	Measured and tested for conformance (106.04)	Sample	—	AASHTO T 2	2 per day	From windrow or roadbed after processing or from approved crusher sampling device	Yes	48 hours

602 - Culverts and Drains

602.03_nat_us_09_06_2005

602.03 General.

Add the following:

Ensure that the final installed alignment of all pipe allows no reverse grades, and does not permit horizontal and vertical alignments to vary from a straight line drawn from center of inlet to center of outlet by more than 2 percent of pipe center length or 1.0 feet, whichever is less.

602.06_nat_us_08_05_2009

602.06 Laying Plastic Pipe.

Delete the second paragraph and substitute the following:

Provide soil-tight bell and spigot joints for plastic pipe culverts.

625 - Turf Establishment

625.03 General.
Delete this subsection and replace with the following:

Apply turf establishment to prepared ground or any disturbed areas once completed. Apply turf establishment to the areas shown on the plans or worklists within 7 days after completion of ground disturbing activities. Unless otherwise specified in writing by the CO apply turf establishment after each section of road has been constructed to template lines. Seeded areas damaged by construction activities shall be reseeded within 10 days of the damage. Do not seed during windy weather or when the ground is excessively wet, frozen, or snow covered.

Assure that all seed and mulch used in the work conforms to the weed free requirements of Section 713.

625.04 Preparing Seedbed.
Delete entire subsection and replace with the following:

Ensure that the surface soil is in a roughened condition favorable for germination and growth.

625.05 Watering
Delete entire subsection.

625.06 Fertilizing.
Delete entire subsection and replace with the following:

Apply fertilizer having a chemical analysis as listed below by the following methods.

(a) Dry Method. Apply the fertilizer with approved mechanical equipment. Hand operated methods are satisfactory on areas inaccessible to mechanical equipment.

(b) Hydraulic method. Use hydraulic-type equipment capable of providing a uniform application using water as the carrying agent. Add fertilizer to the slurry and mix before adding seed. Add the tracer material when designated by the CO.

625.07 Seeding.

(a) Dry method. Delete the third sentence.

Add the following after subsection (b).

Apply seed in the following amounts and mixtures:

Seed Mix A – ≤3500' Elevation
Soil Droughty

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
Soft White Winter Wheat	53%	50
Slender Wheatgrass	21%	20
Annual Ryegrass	21%	20
Austrian Winter Peas	5%	5
	100%	95 lbs/Acre

Seed Mix B1 – ≤3500' Elevation
Soil Saturated; Site Not Adjacent to Wetland

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
White Oats	79%	60
Tufted Hairgrass	5%	4
Annual Ryegrass	13%	10
Alsike Clover	2%	2
	100%	76 lbs/Acre

Seed Mix B2 – ≤3500' Elevation
Soil Saturated; Site Adjacent to Wetland

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
White Oats	49%	60
Annual Ryegrass	49%	60
Alsike Clover	2%	2
	100%	122 lbs/Acre

Seed Mix C1 – ≤3500' Elevation
Soil Not Droughty, Not Saturated; Site Not Adjacent to Wetlands

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
Tufted Hairgrass	5%	4
Annual Ryegrass	13%	10
Winter Triticale	79%	60
Alsike Clover	3%	2
	100%	76 lbs/Acre

Seed Mix C2 – ≤3500' Elevation
Soil Not Droughty, Not Saturated; Site Adjacent to Wetland

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
Annual Ryegrass	49%	60
Winter Triticale	49%	60
Alsike Clover	2%	2
	100%	122 lbs/Acre

Seed Mix D1 – Elevation 3501-4500'
Soil Droughty

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
Slender Wheatgrass	14%	20
Winter Triticale	72%	100
Annual Ryegrass	14%	20
	100%	140 lbs/Acre

Seed Mix D2 – Elevation greater than 4500'
Soil Droughty

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
Winter Triticale	63%	100
Annual Ryegrass	37%	60
	100%	160 lbs/Acre

Seed Mix E1 – Elevation greater than 3500'
Soil Saturated; Site Not Adjacent to Wetland

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
White Oats	79%	60
Tufted Hairgrass	5%	4
Annual Ryegrass	13%	10
Alsike Clover	3%	2
	100%	76 lbs/Acre

Seed Mix E2 – Elevation greater than 3500'
Soil Saturated; Site Adjacent to Wetland

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
White Oats	49%	60
Annual Ryegrass	49%	60
Alsike Clover	2%	2
	100%	122 lbs/Acre

Seed Mix F1 – Elevation greater than 3500'
Soil Not Droughty, Not Saturated; Site Not Adjacent to Wetlands

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
Tufted Hairgrass	5%	4
Annual Ryegrass	13%	10
Winter Triticale	79%	60
Alsike Clover	3%	2
	100%	76 lbs/Acre

Seed Mix F2 – Elevation greater than 3500'
Soil Not Droughty, Not Saturated; Site Adjacent to Wetland

Name of Seed	% of Mixture	Application Rate (lbs/Acre)
Annual Ryegrass	49%	60
Winter Triticale	49%	60
Alsike Clover	2%	2
	100%	122 lbs/Acre

Droughty = Soil lacks moisture in mid-summer

Not Droughty = Soil has moisture in mid-summer

Quality Requirements for Seed:

Purity	Germination	Weed Seed
95%	90%	None

625.08 Mulching.
Delete the entire subsection and replace with the following:

Apply Mulch within ***24*** hours after seeding by the following methods.

(a) Dry Method. Apply mulch with a hand spreader or a spreader utilizing forced air at a rate of ***3000*** pounds per acre. Anchor the mulch with an approved stabilizing emulsion tackifier at a rate of ***N/A*** gallons per acre. Do not mark or deface structure, pavements, utilities, or plant growth with tackifier.

(b) Hydraulic Method. Apply mulch in a separate application from the seed using hydraulic-type equipment according to Subsection 625.07(b).

Apply wood fiber or grass straw cellulose fiber mulch at a rate of ***1500*** pounds per acre.

Apply bonded fiber matrix hydraulic mulch at a minimum rate of ***3000*** pounds per acre. Apply so no hole in the matrix is greater than 0.04 inches. Apply so that no gaps exist between the matrix and the soil.

Inaccessible areas may be mulched by hand. Apply mulch uniformly over the entire disturbed area.

625.09 Protecting and Caring for Seeded Areas
Delete the first sentence and add the following:

Protect and care for seeded areas until final acceptance.

625.11 Measurement.
Delete the entire Subsection and replace with the following:

Measure the Section 625 items listed in the bid schedule according to Subsection 109.02.

625.04 Preparing Seedbed.

Delete "2 inches in diameter and larger," from the second sentence.

625.05_nat_us_03_30_2005

625.05 Watering.

Delete the entire subsection

633 - Permanent Traffic Control

633.03_nat_us_03_03_2005

633.03 General.

Delete the subsection and add the following:

Furnish traffic control devices and guide signs according to the MUTCD, approved USDA-FS and state supplements, the current edition of USDA-FS EM-7100-15 Sign and Poster Guidelines for the Forest Service, and Standard Highway Signs published by FHWA. Submit the sign list for approval before ordering.

633.05_nat_us_03_03_2005

633.05 Panels.

Add the following:

Apply protective overlay film and top edge film as required and according to with manufacturer's recommendations.

Delete the sentence: "Use antitheft fasteners where possible" in the fifth paragraph and replace it with the following: "For each sign panel use at least one antitheft fastener."

705.02 Riprap Rock.

Delete Table 705-1 and replace it with the following:

Gradation Requirements for Riprap

Class	Percent of Rock by Mass	Mass (pounds)	Approximate Cubic Dimension [b,c] (inches)
1	20	22 to 33	6 to 8
	30	11 to 22	5 to 6
	40	1 to 11	2 to 5
	10[a]	0 to 1	0 to 2
2	20	55 to 110	8 to 10
	30	22 to 55	6 to 8
	40	2 to 22	3 to 6
	10[a]	0 to 2	0 to 3
3	20	220 to 330	14 to 16
	30	110 to 220	10 to 14
	40	11 to 110	5 to10
	10[a]	0 to 11	0 to 5
4	20	550 to 770	18 to 20
	30	220 to 570	14 to 18
	40	22 to 220	6 to 14
	10[a]	0 to 22	0 to 6
4a	20	770 to1353	20 to 24
	30	330 to 770	16 to 20
	40	33 to 330	7 to16
	10[a]	0 to 33	0 to 7
5	20	1540 to 2200	26 to 28
	30	1100 to 1540	20 to 26
	40	55 to 1100	8 to 20
	10[a]	0 to 55	0 to 8
6	20	1870 to 3520	28 to 34
	30	1100 to 1870	22 to 28
	40	110 to 1100	10 to 22
	10[a]	0 to 110	0 to 10
7	20	4400 to 5940	35 to 39
	30	2200 to 4400	28 to 35
	40	220 to 2200	14 to 28

	10[a]	0 to 220	0 to 14
8	20	7000 to 10000	42 to 47
	30	4000 to 7000	35 to 42
	40	400 to 4000	16 to 35
	10[a]	0 to 400	0 to 16

(a) Furnish spall and rock fragments graded to provide a stable dense mass.
(b) The volume of a rock with these cubic dimensions has a mass approximately equal to the specified rock mass.
(c) Furnish rock with breadth and thickness at least one-third its length.

718 - Traffic Signing and Marking Material

718.05_nat_us_08_05_2009

718.05 Aluminum Panels

Delete the third paragraph and replace with the following:

Clean, degrease and properly prepare the panels according to methods recommended by the sheeting manufacturer. Conversion coatings will conform to ASTM B-921 or ASTM B-449.